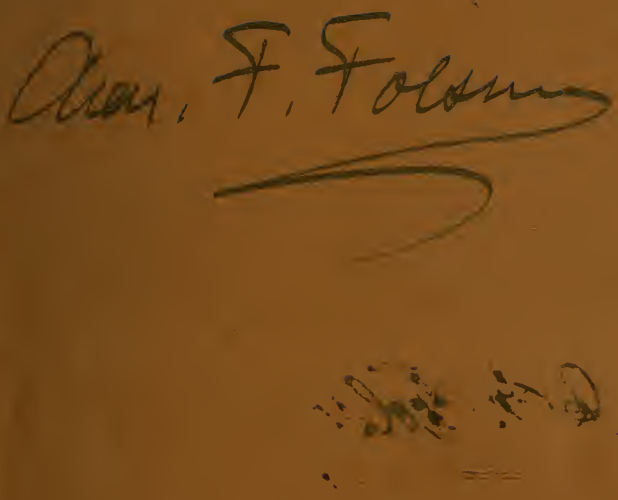

HEALTH,

AND

HOW TO PROMOTE IT.

BY

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"*L'aisance et les bonnes mœurs sont les meilleurs auxiliaires de l'hygiène.*"
—BOUCHARDAT.

NEW YORK:
D. APPLETON AND COMPANY,
549 AND 551 BROADWAY.
1879.

PREFACE.

Hygiene, public and private, has become, of late years, one of the most important elements of modern civilization. It is a subject in which all mankind has an interest, even if it be, as it too often is, an unconscious interest. The life of every man, woman, and child, ought to be guided and governed by its laws. This being so, the subject ought to be presented and agitated in many forms, so that its importance shall be everywhere appreciated. Physicians and their patients are equally interested in it, for the success of physic will be vastly greater wherever hygiene is understood.

In the following pages the author proposes to direct attention principally, almost entirely, to personal matters under individual control ; that is, to what each individual may do for himself, or what *paterfamilias*, or his wife (*incedit regina*), may do for the household.

Public hygiene, or what should be done by communities, States, or cities, the author leaves to such eminent scientists as Mr. Chadwick, Dr. Bowditch, Dr. Bell, of *The Sanitarian*, and others, and to such associations as the American Medical, Public Health, Medico-Legal, of New York, etc., whose united efforts will bring within a few years incalculable good to the whole civilized world.

The present work is addressed to the general reader, no matter what his pursuit, and the language is such as any physician may use in conversation with an intelligent patient; it is therefore as free as such a work can be made from scientific technicalities. It is intended to be rather suggestive than didactic, dealing rather in principles than in minute details; for the last must always be modified by existing conditions, which will vary more or less with every individual, or in every household.

It is offered as a contribution to a great cause, and the writer trusts that it will have some influence in promoting the health, happiness, and welfare of all who may honor it with a careful perusal. The principles advocated have been, to a great extent, put in practice in the personal experience of the writer in various parts of the world, and under many vicissitudes, and he has found them to be not vague theories, but practical truths of the greatest importance.

He begs the reader to pardon the defects of the work, while he accepts the truths therein, which, reduced to practice, will greatly contribute to ease the burdens borne by each and every one of us, from the beginning to the end, more or less, of the mortal career.

R. McS.

Baltimore, *August*, 1878.

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PART I.

CHAPTER I.

INTRODUCTORY REMARKS.—HYGIENE THE BETTER PART OF MEDICINE.

"Medicine is a science which aims at the preservation of health, the cure of diseases, and the physical perfection of man."—RENOUARD.

WE are told authoritatively that threescore and ten years complete the term of man's life. The strong may reach to fourscore, or yet beyond, but the infirmities of age press heavily upon the octogenarian, and his burden is more than his weak shoulders, those ruined pillars, can well bear any longer. His failing knees, now neither firm nor flexible, bend under his weight, as he approaches the last scene of all that ends this "strange eventful history"—or mystery.

A learned and philosophic English physician, Dr. B. W. Richardson, thinks man entitled, even in this degenerate age, to ninety years of life: thirty to attaining to physical and mental maturity; thirty to dwelling on a plane in full possession of his best faculties; and thirty for a gentle decline—so that, at ninety, his mortal career ended, he shall return to earth, "dust to dust," sinking calmly and peacefully into the sleep of death, to rest with his fathers.

But such career implies a virtuous and well-ordered life. Man has but one way, it is said, of coming into life—many in going out of it. He is subject to innumerable casualties

which may carry him off prematurely, but they do not exceed those to which he voluntarily exposes himself. A blind self-indulgence, cares, passions, and anxieties, send the larger portion of the human race to an untimely end.

When Mirza was contemplating the scene on the bridge of the seventy arches, besides some broken ones in the distance, he saw among the crowd of heedless wayfarers that many fell through concealed trap-doors and pitfalls, through mere carelessness, while others were thrust down by imps of darkness hovering over them, some of whose names he learned to be Envy, Avarice, Hate, and Despair.

The name of our enemies or destroying angels, many of them of the brood of Nemesis, may well be called Legion, and, of all men born into this world, they allow not many to escape being ingulfed on the way. Many must go of necessity; but many—thousands, even untold millions—might pass the seventy years of life, and more, safely, happily, *jucunde*, if they would follow well-known rules founded upon knowledge, and guided by the right use of reason. That he who would live to be old must begin early, has passed into a proverb; but living to be old is in itself no great matter. Thomas à Kempis, who was quite a philosopher, says that a good life is the desideratum rather than a long one. No wise man will dispute this dictum. The saint and the sanitarian may doubtless take different views as to a good life; yet, notwithstanding divergences, there are still points of contact. Prudence, justice, fortitude, and temperance, are most important factors in every form of good life, moral, religious, or physical. Dr. Draper himself might concede this much, and admit, for once, a concordance between science and religion.

Man born of woman hath but a short time to live, and is full of misery. But man need not curtail his life, nor add to his miseries. And yet he does both with, it almost seems, premeditated folly. *Dum vivimus, vivamus.* That is a good maxim if rightly applied. While we live, let us live.

So be it ; and let us live like rational beings. Let us bear the ills we have with patience and fortitude, but let us not multiply them. Let us add nothing wantonly to our own sorrows or ailments, or to those of our friends or of society.

The writer, as a physician, only proposes to discuss the evils that afflict our race, and are preventable, from a medical standpoint. The physician cannot go beyond the physical and intellectual welfare of man. Higher and more important considerations must be left to a science beyond and higher than medicine. John Selden says : "If a physician sees you eat anything that is not good for the body, to keep you from it he cries out, '*It is poison!*' If the divine sees you do anything that is hurtful to your soul, to keep you from it he cries out, 'You are damned!'" The doctor of medicine says to a man who abuses alcohol : "You are poisoning your blood, and impairing the organ of your intellect, to the detriment of body and mind. While injuring your physical and mental faculties, you are also hurrying yourself to premature death." The doctor thus warns his patient against traps and pitfalls. The doctor of divinity says to the same erring fellow-creature, "My good friend, you are taking home to yourself an enemy capable of sending you at once, body and soul, to hell!"

The doctors, in this instance, do not differ, at least in discerning the danger, and giving warning to the party exposing himself, not only to one but to many pitfalls. Immeasurable is the distance between the ends they aim at, but both attempt to rescue a man from the power of an enemy much too strong for ordinary humanity.

Some think that, when a man commits suicide, he thereby, *ipso facto*, proves his own insanity. Some think otherwise. As skillful dialecticians might keep up an argument upon this matter beyond the ordinary term of a mortal life, and still leave the question unsettled, if not more perplexed than ever, we may waive argument, and simply assert that, if it be so, insanity is vastly more common than even its

partial friends, the specialists who have charge of insane asylums, ever assert it to be. Every man who hastens his own end by folly, imprudence, or wickedness, is, in some sense, a self-murderer. *Plures occidit gula quam gladius.* The ruinous effects of gluttony and drunkenness are obvious to all men ; but excesses much less gross, in which refined and elegant and even religious men, and women too, may and do participate, constantly but insidiously swell the numbers of those who fall prematurely by the way. Temperance, not luxury, is a chief contributor to health and happiness, as well as to a green old age. It is strange that the philosopher who may be considered as the first founder of temperance societies—who, indeed, was almost intemperate in his temperance only—should be looked upon as the very coryphæus of the elegant sensualists, who have reversed his maxims for the pleasures and penalties of luxurious living;—"*Se sepelire*," as Seneca says, "*vino et epulis.*"

Excess and penalty are as sure as cause and effect in all other relations. Man naturally and properly is always engaged in the pursuit of happiness. The American claims the right to such pursuit as inalienable from his individual liberty. Now, whatever his pretensions, his happiness depends greatly upon his health—moral and physical ; and physical and moral health, says Hufeland, are as nearly related as the soul and the body. But the greater part of our countrymen, especially in the cities, have at best but a semi-invalid existence. Woman is ever an invalid ("*La femme est une malade*"), says a French physician; but men, too, though stronger and firmer than the more lovely part of our race, are rarely in that enjoyable degree of health that makes life itself a pleasure.

Perhaps the reader has felt upon some occasions during his life—at sea, mayhap, or away in the highlands—a sense of joyousness or buoyancy, not the reward of any good action, but simply a free gift of the *genius loci*, when he has quaffed in the pure air, and found it more deliciously ex-

hilarating than ever were draughts of sparkling wine from the French vineyards ; and he has found therein for a time ethereal that seems almost celestial happiness.

The writer, who, like most civilized men, never loses consciousness of the burden of the physical frame, remembers having just such sensations in the *tierras templadas*, on the mountain-slopes of Mexico. Passing from the lethiferous lowlands on the coast, the *tierras calientes*, where the air is still scorched by the near passage of Phaëthon's fiery chariot when he took his fatal drive, though the sluggish marshes have recovered their foul waters, to higher and purer regions, nearer to heaven, the lungs seemed to expand to let the pure oxygenated air reach to their deepest recesses, the blood became revitalized, the circulation increased in vigor, and altogether there was some such sense of physical pleasure as Adam may have enjoyed in paradise. His numerous companions, every son-of-a-gun we may call them (excuse the slang — it was a brigade of Scott's invading army), showed the effects of physical revival ; and every soldier's face, from being recently gloomy and despondent in expression, became fairly radiant even through the enamel of dirt and gunpowder which had been duly substituted for soap-and-water. He invokes the testimony of the surviving Mexican veterans as to this fact.

It takes a nomadic life thus to rejuvenate the wayfarer : soldiering, or hunting, or fishing, or sailing ; sleeping under canvas, or in the open air, under the broad canopy of heaven. As cultivated people cannot, however, conveniently follow such heroes of the wilderness as Sitting Bull or Chief Joseph, on either side, *pro* or *con*, with musket and bayonet, or rifle and scalping-knife, they might still find some practicable means of recuperating vital resources. All the numerous medicinal springs resorted to in America (and Europe) are advertised with lengthy certificates of cures or revivals effected by their health-giving waters. If Ponce de Leon had lived in these days, he could have found a thousand

springs instead of the *one* of his fruitless pursuit, whose waters would wash out the wrinkles of age, and restore the vigor and freshness of youth. Without the trouble and risks of exploring the jungles of *Pascua Florida*, he could have found them in numerous pamphlets, lieing, lying (how do you spell it?) peacefully together in every doctor's waste-basket. This is not intended to impugn the certificates. Men and women do recuperate annually, by hundreds or thousands, at all of the springs. A witty French physician advised his patients to go to the springs by all means, but with the proviso that they should never drink of the waters. This is but a clever way of suggesting what the writer, in his clumsy way, maintains to be a text with a meaning. The medicinal springs are not indeed without medicinal virtues. To say otherwise would be to contradict the common experience of mankind. But the greatest sanitary benefit obtained at such resorts is but exceptionally from the waters. Mr. Moreanmore and his wife (he is a great business-man, and she is a leader in society) hold up pretty well during the winter (though she has "the doctor" to see her every other day), but, before the summer solstice, they both feel much the worse for wear, learn that they have heart, and stomach, and liver, though they have never studied anatomy, and are more or less liable to a moral jaundice. When, in little domestic discussions, the gentleman tells his wife—

"... You drive me to despair"—

and the vexed lady is just

"Too proud to weep, and too polite to swear"—

it is time to go, for both need it, to the springs, to the sea, to the mountains—anywhere, to restore the perverted functions, and mental and physical equilibrium.

And whither shall they go? Where will they find a panacea for all the ills that flesh is heir to? Why, for a

great many of them, not all, wherever they can find pure air and pure water—let us speak not of chemical purity, which is unknown in Nature, but of sanitary purity—and good food, and good lodgings, and good company. Once upon a time, it is recorded, people had the unspeakable privilege of exchanging their burdens with each other, but practically the result was not satisfactory. Our health-seeking friends must throw off such portion of the burden as they may, the corroding cares of business, society rivalries, ambition, and vanity; and then, nothing short of a bad conscience, not even a bad stomach, will prevent them from improvement that probably will admit of demonstration both by measure and weight. Whether in the Adirondacks, on the Alleghanies, at the Virginia Springs, or on the sea-shore, they will acquire a sort of second-sight, and see once again, as in youth, a little *couleur de rose* in their surroundings. The burden of life may not be lighter in fact, but they will feel more able to bear it; they can straighten up their rounded shoulders, though the burden be still there, and they can walk erect and look up, as God intended those creatures made in his image and likeness to do. When creeping along, almost bowed down to the earth, they might humbly crave Mr. Darwin's pardon for looking upward; but, when standing erect, they can look him in the face, and tell him what Carlyle said of him, which was not complimentary.

Sir John Franklin informs us that his explorers, when suffering with cold and the pangs of hunger, became extremely petulant toward each other, two or three frequently quarreling about nothing, and then each perhaps expressing a sort of pity for the hopeless imbecility of the others. The mental was as much impaired as the bodily strength by hardships and involuntary fasting, so close are the bonds between our higher and lower faculties. A dose of blue-pill, says the learned Dr. Carpenter, will often rescue a man from a state of melancholy or moroseness; and the doctor

is right, though others may not agree with him : but we do not here propose to discuss the problems of practical medicine.

We mean to say that perverted health is a great factor in personal, domestic, and social unhappiness. We mean to assert that the city man and his wife, whom we have sent to breathe pure air and to enjoy relaxation, will get a taste of the elixir of life which is far more precious than the philosopher's stone. Midas was the most unhappy of men when everything he touched turned to gold. And our rich merchant has probably been growing more and more unhappy with every addition to his wealth ; and his wife equally so with her superb telltale mirrors, and every new, flashing jewel that she first craves and then possesses. They have grasped some baubles in crossing the bridge which seem much less valuable when possessed than when pursued. But, when they get renewed health, they get something really worth having ; something incomparably more valuable than any of the gifts of that fickle jade whom men call Fortune. Riches and fame, and power and glory, and learning, are all *bagatelle* as compared with health. If the family altars erected to Mammon in all the great houses in America were overturned, and others erected in their places to the goddess of health, with worship as sincere as that now given to the golden idol, Americans would cease at once to be a preëminently unhappy people. The goddess of liberty herself dispenses not more blessings than the goddess of health, but the two could well stand side by side to be worshiped together in our republican Pantheon. "Give me liberty, or give me death !" cries an enthusiastic patriot ; and many a poor fellow, without expressing any "fine sentiments," sends a half-ounce of lead through his cerebral lobes, because of a thought which only the report of the pistol interprets : *Give me health, or give me death !* The man does not know that his unseen tormentor is, it may be, but a legion of blue-devils contesting with Archeus

the possession of the peptic glands, whence they could be put to flight in a short time by a regimen of skim-milk and a little medicine; but he does know that health, happiness, and even hope itself, have fled from his casket, and he rashly releases his immortal spirit from its mortal frame.

A word, *en passant*, on milk-diet: We lately heard an eminent physician say that he had lived for some six months on this food exclusively, on account of a chronic malady; and that during all that time, though not cured, his life was almost blissful. It passed as a pleasant, happy dream, and yet it was not a dream, for his mental faculties, always bright, were unusually active and clear, with none of the inconsequential visions of the dream; and his bodily frame resumed the wellnigh forgotten elasticity of earlier years.

The writer is not suggesting that the adult world go back to milk-diet, which, as the apostle says, is food for babes. The *milk-cure* has the approbation of many physicians, though it was not a cure in the case just related, nor in the general do we propose to consider or treat of cures. In the renovation of health, curative agencies must indeed find a place, and more than one infirmity may be remedied by such measures as we will advocate: thus despondency, bad temper, and rudeness, may be replaced by hope, equanimity, and gentleness. Mr. and Mrs. Moreanmore shall become polite and pleasant toward each other, for after all that "little unpleasantness" between them, unknown to themselves, owned a subjective rather than an objective origin. Old Cornaro found that, whenever his stomach was disturbed, he was taciturn and gloomy; whereas, when that organ was kept in good condition by that systematic attention which he understood so well, he was always in a good-humor with himself, and bright and agreeable toward all around him. The reader, perhaps, may find the force of this statement to come home to him.

Now, as health is the best gift that man can have, so far as the mere mortal career is concerned, it follows that

its conservation merits perpetual and universal attention. When the poet says that life is a *fitful fever*, he admits that the fever is paroxysmal, or periodical, and all such are more or less amenable to treatment. To say nothing of physic, the paroxysms may be warded off for weeks, for months, for years, by the gentle ministrations of Hygeia. There is nothing occult in sanitary science ; it is open to all men, and it should be a life-guide for all men. It is not at all proposed hereby that a man should always be thinking of his health, and of nothing else. Far from it. Such a one is in danger of moping his life away, and, *propter vitam vivendi, perdere causas.* A man does not live to take care of his health ; but, *chemin faisant*, he takes care of his health that he may live.

As a man of thoughtful, cultured, and well-balanced mind preserves his moral integrity by well-formed habits, without making any exact analysis in regard to all of his actions, so he may, in like manner, when duly instructed, preserve his physical integrity, almost, it would seem, by instinct, and without apparent painstaking or excessive precaution in his daily career. Rules of life are right and proper, but they must admit of some latitude ; a little swerving at times from perfectly straight lines is necessary to the mobility of human nature. Rigid rules, like strait-jackets, are only of occasional application. A sensible man ought to trace out for himself a course in life which he shall follow with honest fidelity. Nevertheless, he will find that mathematical precision, admitting only straight lines or right angles, will be unattainable.

When a ship is bound across the ocean, the captain lays off his course and means to keep to the great circle ; but one day he will be driven well to the north and another well to the south of it. Sometimes a wind abeam lays his craft on one side and sometimes on the other, and, in fact, between varying winds and rolling seas, she is rarely on an even keel ; and yet, by good management, she does keep

pretty nearly on her course, and reaches her destination not much the worse for wear, near about the time originally indicated.

And so in our sixty, seventy, or eighty years of the life-voyage, we should keep as nearly as we reasonably can to the right way, without being unduly aggrieved by transient variations.

The writer will undertake to make suggestions to inquirers, as to the most available means of keeping on the right way in the life-career, and of avoiding many, at least, of the traps and pitfalls set for the unwary. Accepting that broad definition of medicine which involves with the cure of diseases the *preservation of health* and the *physical perfection of man*, he feels that he is upon his own ground when he attempts to present some of the most important measures necessary to the attainment of these great desiderata. The measures suggested will be principally such as directly affect the individual, and are more or less under individual control. The wide range of sanitary science, which involves great sanitary works and public hygiene, is beyond the scope of a manual intended for household reading. The attempt will, therefore, not be made to condense it for these pages.

The writer has heard it suggested that doctors, who live by human infirmities, ought to be rather employed in their cure than in their prevention. When there is no more sickness, then our Dr. Othello's occupation will be gone. Truly, then he will have to take to other pursuits. And so, when the millennium comes, and all the world will be at peace, soldiers must be pensioned for life, lawyers will be briefless, and even the clergy may repose in happy sinecures. But the millennium has not come; and, while medicine embraces *prevention* and *cure*, its doctors must be true to their trust. And as history will repeat itself, many who will be shown the right will

"still the wrong pursue,"

and will still employ the doctor to give them *medicine* as well as counsel. But those who will adhere to the right way will yet want expert advice, and the doctor may be more pleasantly and more successfully engaged in directing the course and habits of life than in giving drugs to those who needs must have them. Their use will never cease, though people may find that they often need only advice, and not medicine. A distinguished and witty physician (O. W. Holmes) has said that, if all the medicine in the world were thrown into the sea, it would be the better for the people, but the worse for the fishes. Perhaps the professor was right, for medicines have power for evil as well as for good, and are much abused ; but if the learned gentleman ever has a fit of the ague upon him, and does not take medicine, we would only say that his wit surpasses his wisdom, which at present we are far from affirming.

Furthermore, we may say that, as men are often thrust through the traps in spite of knowledge and precaution, so sickness will likewise be more or less their portion forever —a part of their sad inheritance. "Is it not very remarkable," says Chateaubriand, "and at the same time extremely philosophical, that in Hebrew the generic term for man should signify *fever* or *pain?* The root of *enosh*, *man*, is the verb *anash, to be dangerously ill.* This appellation was not given to our first parent by the Almighty ; he called him simply Adam, *red earth*, or *slime.* It was not till after the fall that Adam's posterity assumed the name of *enosh*, or *man*, which was so perfectly adapted to his afflictions, and most eloquently reminded him both of his guilt and its punishment. Perhaps Adam, when he witnessed the pangs of his wife, and took into his arms Cain, his first-born son, lifting him toward heaven, exclaimed, in the acuteness of his feelings, '*Enosh*, oh, anguish!'—a doleful exclamation that may have led afterward to the designation of the human race."

The wisdom of the future, no more than the wisdom of

the past, will blot out sickness, sorrow, and suffering, from the world; but it may mitigate them more and more, and make great practical additions to the aggregate sum of human happiness.

Sanitary science is the most beneficent of all developed from mortal wisdom; and we propose to offer some lessons derived therefrom to those readers who not only wish to avoid traps and pitfalls, but who desire the most rational enjoyment of life.

At this period of medical history, as Dr. Bowditch says truly, preventive has precedence over curative medicine. Hermippus, of old, dedicated a tablet to "Æsculapius and Health;" now, sustained by Dr. Bowditch, we may reverse the terms, and let the inscription read—

"*Sanitati et Æsculapio.*"

CHAPTER II.

THE FOUR DIVISIONS OF HUMAN LIFE.

Pythagoras divided the life of man into four equal parts, and indeed in this he followed very fairly Nature's indications. From the first to the twentieth year the *child* grows to *manhood;* from the twentieth to the fortieth year he recognized the *young man;* from the fortieth to the sixtieth, *the man;* from the sixtieth to the eightieth, the *declining* or *old man;* beyond eighty, *stat hominis umbra:* the man but seems to live, and has no longer any part in the drama of life.

Accepting the above as a natural division, we may enter upon a survey of the interests, the wants and needs, the lets and hinderances, pertaining to

THE FIRST QUARTER, OR THE FIRST SCORE OF YEARS.

Section 1.—Infant Life.

"*Les enfants sont ce qu'on les fait.*"
"Mere wax as yet, you fashion them with ease."

For the first five years after his arrival, the young hope of the family has little else to do than to grow and to cut his teeth. At first he is naked and not ashamed, but the tender nurse soon gets him into his swaddling-clothes, which, if she is judicious, will be loose and easy in all dimensions. He takes a tepid bath before his toilet is made, and makes his start, much against his will, very nice and clean. He expresses his objections to the washing in no measured

tones, while at the same time he fills his lungs with air, and blows out some mucus. This air, by-the-way, ought to be pure and soft, not foul nor arid. His hips ought not to be bound up in gum or other water-proof material.

He is hungry from the start, if not voracious, and he takes to his only appointed occupation with a zest that does him no discredit. His food ought to be exactly of the right sort; and Nature will provide for that, if the mother be healthy and qualified for her appointed duty. If she be not so, then Heaven help the baby!—which it often does by transplanting him.

For the first six months he should draw his supplies exclusively from the maternal fountains; varied only by occasional spoonfuls of water, without ice. When he gets just enough, say from one to two pints in twenty-four hours, he will thrive; when too little, he will waste away. When he gets too much, it's no great matter—he will find relief "in the nurse's arms," according to his well-established custom.

During these early months a healthy child will rarely cry, and when he does it is his only means of expressing suffering. The daily bath may annoy him, especially if too warm or too cold; it should be made grateful to his feelings, and not much prolonged. Otherwise he may cry because of an obtrusive pin, or from the pressure of a button, or even from a piece of concrete starch. But in general terms he will not cry unless suffering, whether from injury, indigestion, or organic disease.

If a careful scrutiny will not reveal the source of his distress, medical advice, but not necessarily medicine, should be taken. The quantity and quality of his food must be investigated, and therewith the health and habits of the mother or nurse, and the condition of his digestive organs, which are often faulty by inheritance. All hygienic surroundings must be looked to, and all treatment to which the little one is subjected, in-doors or out. The baby must have sun and air, but he often suffers from senseless exposure

to these great sanitary agencies. A cutting wind or a burning sun may be too much for him. Dr. West tells us of a little patient of his who was taken out by his nurse during one of the hottest days in June :

" He was quite well and cheerful when he left the house, but, after being out for some time, began to breathe hurriedly and irregularly, and his nurse in consequence brought him home. I saw him about two hours afterward. He was then restless, fretful, alarmed ; his surface generally hot, and his head especially so, the brain pulsating forcibly through the anterior fontanelle ; the pulse too rapid to be counted ; the respiration hurried, labored, and irregular ; and there were constant startings of the tendons of the extremities. The child was on the eve of an attack of convulsions, but the tepid bath relieved the heat of the skin, the pulse fell, and the subsultus diminished."

A little judicious management saved the child, but it will be observed that the wrong application of a right principle, that is, of exposing the baby to sunlight, very nearly lost its life. We have often seen children drawn about the streets of Baltimore in their little carriages, with faces upturned to a blaze of light that only eagle eyes could bear with impunity. Is it any wonder that such children should fret and cry, and become hot and feverish, and should even die of cerebral congestion or convulsions, as the result of such ill-judged attempts to make them healthy ?

The advice of a prudent physician to a sensible mother will keep the child from many dangers, independently of medicine.

In a little time, our young adventurer begins to travel on all-fours, as becomes the animal that goes on four legs in the morning. He ought to be allowed to scramble for himself, so that there is no fire or pitfall to seduce his inexperience. His muscular efforts are very advantageous, and should be encouraged.

Six months and the heat of summer being past, his diet

may be gradually changed. Some delicate broth may be alternated with the milk, and then a little rice, or bread, or mealy potato; but not much starchy food withal during the first year. As Nature supplies him with teeth, he can begin to nibble a little. He will be well pleased with a chicken-bone, with scraps of meat adhering to it.

At the expiration of a year, and again, we may say, the heat of summer, he ought no longer to subsist upon his mother. He should continue indeed for several years to live principally upon milk-food. The milk should be sweet, fresh, pure. If not, pathological conditions will be developed—indigestion, thrush, gastritis, enteritis, or other maladies—when he gets beyond hygiene to medicine.

In regard to getting good milk, Drs. Meigs and Pepper say, with abundant reason:

"The person who has charge of the child should always, if possible, know the milkman personally, and know exactly where he comes from, and what manner of man he may be. An *honest* farmer or dairyman, who pastures his own cows on a healthy farm, is the man to be employed to furnish milk to the poor little baby who has to seek another dairy than his mother's. . . . A good specimen of cow's milk ought to be slightly acid or neutral; it should contain a certain average proportion of cream, and it should have a certain average density."

The above is a very important suggestion, not only for the nursing baby, but for the larger child also. Milk bought from indiscriminate venders carries disease and death into many a household in all our great cities.

It is beyond our province to pursue this matter here, of which such a fearful *exposé* has been published by Prof. S. R. Percy, of New York, and in various numbers of *The Sanitarian*.[1] The milk question demands both public and private attention.

[1] We may refer the reader especially to an article on the subject by Dr. Bell, in the number for August, 1877.

For the first five years our nursery-plant requires sedulous attention to clothing, and in regard to exposure to vicissitudes. The child may have very fine clothes, and be very ill clad; and indeed this is but too common. He or she should have room to spread, in very easy-fitting garments, without constriction of body or limbs. The clothes should give adequate protection, according to the weather, without being unduly cumbersome. Linen is not so good for underwear as cotton. Wool is better than either; the weight and thickness being adapted to the season, and even to diurnal changes, which always require attention.

Good, pure air, in and out of doors, is all-important. It is a common error to have the nursery overheated, and often crowded; and sometimes, by an unwise economy, warm air is retained for the purpose of saving fuel. This saving will scarcely offset the expenditure for drugs which it induces. Even in the coldest weather, all the used air should be blown out of the nursery every day, and the apartment filled with fresh air—no matter how cold—though, while this process is going on, our little friend should be kept comfortable elsewhere, and in a room where no busy house-maid is dusting or sweeping.

We will merely remark here, incidentally, that air little less poisonous than that of the *Grotto del Cane* finds its way, in many houses, into that apartment where purity is most needed, from defective traps. We have seen, as every physician may have seen, children stricken with sudden death, with rapid discoloration of the skin—a virulent form of what may be called spotted fever—from such poisoned air. Adults feel the same influence, but they are less susceptible to its toxic potency. Some degree of it is largely influential in the production of that common and fatal disease among city children known as *cholera infantum*. What proves fatal to their tender organization may only produce lassitude or *malaise* with their parents and nurses.

The different susceptibilities of children and robust

adults may be illustrated by the following fact stated by Dr. Murchison: "Twenty out of twenty-two boys, at the same school, were seized with violent vomiting, purging, prostration, and fever, within three hours. One boy had been seized with similar symptoms two days before, and died; another also succumbed. So alarming was the outbreak that poisoning was suspected; but, after a careful examination, it was found that the sole cause of disease was to be attributed to the opening of a drain at the back of the house. This drain had been choked up for many years, and had been opened two days before the first illness occurred. The effluvia from the drain were most offensive, and the boys had watched the workmen cleaning it out; none of the workmen, however, were subsequently attacked with any of the symptoms which so seriously affected the boys."

The poor boys had not, and could not have, the *dura ilia messorum*, and their tender digestive organs, blood, and nervous system, *were poisoned* by the foul air. When such air pervades a house, especially when it invades a room whence its escape is impeded, not only the first-born, but every other therein, is in danger of being smitten by the hand of death.

As to out-of-door air, as there is said to be reason in all things, so there may be unreason in all things. When a child is playing around a country-house, on a cold day, and the cold becomes painful, it will usually run in to get a warming by the fire. When playing in the summer, and the burning sun is beyond endurance, it seeks the shade of a friendly tree, or the shady side of the house. But, in town, little children whose parents do not approve the method of education suggested as the best to Mr. Pickwick, are often sent out with rigid system by their good mothers for so many hours every day, in charge of a nurse who is often neither careful nor wise. They are rarely dressed for comfort or health; but, if the mother has taste and means,

they will be quite in the fashion, according to their time of life.

The nurse, well clad herself, will often keep her little charges standing in a biting wind, which few adults, the children's father, mayhap, included, could bear with impunity, while she is attending to interests of her own, or, maybe, exchanging the compliments of the season with a neighboring nurse or footman. Passive exposure to cold is generally hazardous. Or it may be the summer sun which has to be avoided ; unless the child is to be wantonly exposed to the danger which has been already presented in a quotation from Dr. West.

Sun and air are undoubtedly necessary. "Coddling," as it is called, is very bad, but "hardening" is not without its dangers. A child of delicate stamina may be brought up to healthy maturity by rational hygiene ; but extremes must be avoided. If you expose a fig or orange tree to severe cold, to harden it, you will find your mistake when you see that the nipping frost has killed it. It may be just so with the child. There is a middle course, a *via media*, to be observed in this, as in so many other matters affecting human interests.

The little boy or girl, it matters little which at this stage, will be demanding something more than milk and bread for food, when he has vocabulary enough to call for what he wants. But he should be dieted, *principally*, upon these two articles, which, when good, contain *all* that is necessary for his wholesome nutrition. Milk is, indeed, one of the marvels of Nature. Physiologists tell us that certain varieties of elements are necessary to the nutrition of animal life, and especially of human life. The infant requires, equally with his father and mother, water and saccharine or starchy, oleaginous, albuminous, and earthy or saline matters, as lime and soda, to maintain any standard of health, or even existence. Not one of them can be dispensed with without detriment ; and nothing more need be

added. Bread-and-butter and water contain them all, but such is not the available food for early infancy.

The one comprehensive form of food which contains all necessary ingredients is milk. No element required for the nutrition of this young being is omitted. The adaptation between the nature of the food and the capabilities of the recipient is perfect ; and, moreover, strange to say, this food, while preserving its integrity, undergoes changes in the relative proportions of its elements, with the total unconsciousness of her who supplies it, adapted to the growing needs of the child. Week by week, and month by month, it undergoes these nutritive changes. Thus, as the relative proportion of sugar decreases, the relative proportion of caseine increases, in a ratio with the wants of the growing organism.

Will the learned *agnostics* of the day insult the common-sense of mankind by attributing all this work of design to chance, or to Nature, rather than to Nature's God ?

When the child is advanced enough for stronger food, bread-and-butter and soft-boiled eggs become appropriate ; and then a little delicate meat once a day, with some simple vegetables. He may have four meals a day ; but he should not have, as he so often has, the indiscriminate use of everything on the table. He may have a little ripe and selected fruit in season, but not as dessert ; it may form a part of a meal, but it should not be superadded to a sufficient meal. The most wholesome articles given as *additions* to a full meal become unwholesome by improper use. Even a glass of milk, added to a meal (other than constituting a part of it), is not only superfluous but injurious. Crude fruits, as raisins, should be kept away. The writer has now under his care a child ill from free indulgence in bananas.

Tea and coffee should be ruled out ; and wine, beer, and liquors, should be given under just such restrictions as would govern the use of the tincture of opium. In other words, they should never enter into the subsistence of any

healthy child. Food too heavy, rich, strong, or stimulating, may cause rapid development, but, as Hufeland says, it accelerates unduly "their vital operation and consumption; the whole system and organs are put into too great activity; a foundation is originally laid for a more vigorous but a quicker life; and, under the idea of strengthening, one really establishes the principal cause of a short life." Thus, if excess is not immediately followed by illness, which it commonly is, however, it makes even infancy "fast," in anticipation of a "fast youth" and early decay; from all of which Young America ought to be restrained by the beginnings in the nursery. "*Obsta principiis.*"

The child should always have clean clothes, clean bedding, a clean and judiciously aired bedchamber, and a clean skin, kept so by daily ablutions. It is better not to attempt to harden it by disagreeably cold baths; and it should not be made too soft by very warm baths. The bath might be, as a general rule, a few degrees warmer than the temperature of the room, except in very hot weather, when it might be made just so much cooler as to be grateful and refreshing.

But withal cleanliness should not amount to a parental mania. As a general proposition, the child should be kept clean, but nevertheless there are times and places when he ought to roll and tumble upon the face of Mother Earth, even if hands and face, and knees and feet, do take something from her surface, and garments become rent and spattered. When children claim their "rights," such as these ought to be asserted and respected.

Section 2.—Intellectual and Moral Training.

Supposing the prime physical necessities attended to for the infant years, in all such matters as food, clothing, air, and water, its internal and external use, there are other matters of extreme importance, which may not be left out

of consideration. When should education begin? Very early; though we will not go with Coleridge to the ante-natal history. We may agree, indeed, with Dr. Moore, when he asserts that "our education may be said to begin with our forefathers. The child of the morally instructed is most capable of instruction; and intellectual excellence is generally the result of ages of mental cultivation;" and it is well for the child, in every sense, when the best moral influences surround its birth.

By the time a child reaches five or seven years, it ought to have a good deal of education. It (boy or girl, it is no matter) should have some well-fixed ideas about right and wrong in its own condition. It should know that it is subject to authority; and it should also appreciate that the authority is justice, tempered with mercy. Moral and religious ideas may be impressed upon young minds without didactic lessons. They can learn a great deal without the use of books, or without knowing a letter. They are keen observers—simple, but not simpletons. Good example is early appreciated; and for that matter so is bad example. A well-set, soldierly-looking man, as upright in carriage as in character, was walking one day in the streets of Baltimore in the snow, making well-marked footprints. Happening to look behind, he saw his little son stretching his legs to their utmost to walk literally in the footsteps of his father. The general met a friend, and told him, with a twinkle in his eye, that that boy had just given him a lesson as to the duties of parents toward their children.—(Miss Mason's "Life of General Robert E. Lee.")

"History is philosophy teaching by example," and this applies as well to private and domestic as to public history. For the moral, mental, and physical welfare of the child, bad passions should be kept in check—irregular desires, and such mean vices as lying, cheating, stealing. Precept, firm but gentle correction, and, more than all, good example, should be used to prevent or correct these faults which be-

gin in infirmity and may end in crime. It is not a poetic fiction to say that the "little actor" lives and moves

> "As if his whole vocation
> Were endless imitation."

Those who have charge of children should never forget how naturally they imitate those by whom they are surrounded.

Faults should be corrected with care and circumspection. Terror should never enter into means of correction, neither physical nor mental. Children have been frightened into convulsions, and even into insanity, by being shut up for punishment in dark places. This would be not unlikely to follow where their fears have been encouraged by ignorant nurses, who people all dark places with spectres or the spirits of the dead. No imaginary fears should ever be excited; and they should know of no skeleton in the closet more terrific than a little twig of birch, which may be referred to occasionally, and used rarely, with due discretion, and perhaps with as much pain to the parent as to the child. No nurse should ever be allowed to threaten children with "the doctor," as they frequently do, for the doctor should always have the confidence of his little patients to do them justice. All foolish threats should be positively forbidden.

Over-rigor with children in regard to their ordinary faults, from which none are exempt, is about as mischievous as over-indulgence. Too much exaction is far more apt to make of them little hypocrites than little saints.

A few sentences, which we render from a work by Fénelon, "De l'Éducation des Filles," may be applied to all children: "We must remember that children have but young heads, that their age inclines them to pleasure, and that persons in charge sometimes exact of them a degree of uniformity and of seriousness of which they themselves would be incapable. They make even a dangerous impression of *ennui* and sadness upon their temperament, in speaking to them always of words and things above their com-

prehension; no liberty, no enjoyment; always lessons, silence, constrained position, correction, and menaces."

Children would not grow so weary of their lessons if little sallies of diversion were sometimes permitted; in fact, they require some variety to escape from mental weariness. Let them look around occasionally, or have some little play; a very exacting regularity does them harm; you may awake their desires for information by amusing stories, and teach them much that they ought to learn by pleasant conversation. Such pains as may be taken to season serious occupations with enjoyment will tend to abate the desires of youth for dangerous amusements. It is weariness and constraint which make children so wild for diversion. If a girl finds in her mother an agreeable companion, she will not be so anxious to get away from her for unsafe companions. Let their pleasures be simple, like their food, and not exciting. And, in regard to aliment for mind and body, this great moralist says, "Sobriety always gives appetite, without any need for rousing it with high-seasoned dishes, which lead to intemperance." "Temperance," said an ancient author, "is the best handmaid of pleasure; with this, temperance, which gives health to body and mind, one is always in a state of rational enjoyment; one needs neither apparatus, now shows, nor expense, to be pleased; a little play devised at home, reading, some work to be accomplished, a walk, innocent conversation, which gives relaxation to work, give more real satisfaction than the finest music of the composers."

These simple pleasures are quiet but safe; there are others more exciting and very unsafe. Simple pleasures wear well, and leave no evil in their train; they are always beneficent, while others are like those high-flavored and adulterated wines which please the taste most at first, but which soon injure the health of those who use them. The mental temperament, as well as the taste, is spoiled in the pursuit of highly vivid and exciting pleasures. The best

that we can do for children under our charge is to accustom them to this simple life, to keep them in the habit of it while we can, and to warn them against the dangers of those pleasures which excite the passions; and not to leave them to themselves at the time, as it is so generally done, when the passions become most active, and when, consequently, they have most need of restraint.

Section 3.—The Kindergarten.

Children are not benefited by being set too early at books. Youthful prodigies rarely astonish the world by superior wisdom or learning in after-years. Hufeland says, very justly: "The powers of the mind must not be exerted too early. A child may begin too soon, when that period is chosen during which Nature is still employed in forming the bodily organs and powers, and has need of all her strength for that purpose. This period extends to the seventh year; and if a child be obliged at an earlier age to apply to learning, and be confined in a sitting posture, its body will be deprived of the noblest part of its powers, which must be now wasted by the business of thinking; and the consequences will be, a checking of the growth, imperfect formation of the limbs, muscular weakness, bad digestion, corrupt juices, the scrofula, and a preponderance of the nervous system in the whole machine which will become burdensome during life, by nervous affections, the hypochondriasis, and evils of the like kind."

A well-ordered *Kindergarten* comes in well to substitute an intelligent teacher for a nursery-maid. It is a grateful sight to see a well-bred, intelligent, neat, and tidy young lady, with a group of happy-looking children around her, giving them instruction in a well-aired apartment, or, better, in the open air, when they think she is only amusing them. We have known children who were very insubordinate at home, for want of discipline and occupation, to learn and

observe proprieties at the Kindergarten, without any feeling that they were in a penal colony, where rebellion, as in some sterner schools, is considered a sort of point of honor.

When the Kindergarten is equal to the original design, it is a proper school in which to educate (*educare*) the minds and bodies of little children, without detriment, to say nothing of exhaustion, to either. Instead of detriment, we may justly expect a wholesome development of *sound progress* in all dimensions.

Section 4.—Childhood.—Mental and Physical Culture.

"He said that three things were essential for children: intellect, exercise, discipline.

"The difference between intelligence and ignorance is as the difference between life and death.

"He said that science (knowledge) was an ornament in prosperity and a refuge in adversity; that those who gave a good education to children ought to be esteemed as much as their parents, since the latter had simply given them life, while the former had taught them how to make life pass profitably and happily."—Sayings of Aristotle.

Climacterics.—Our forefathers had a conviction that the human frame underwent a complete change every seven years, and that it reached the *grand climacteric* at 7×9 years. This is in a measure following the numerical system of Pythagoras; and, if it be somewhat imaginary, it still has a resemblance to truth.

The first seven years of life are very critical, and statistics show us that the mortality exhibits a wonderfully large percentage (exceeding forty per cent.) during that term.

Thereafter the organization is firmer, the brain reaches nearly to its full development, and becomes prepared for exercise in a higher cultivation of the mental faculties. Books come properly into use. We have now schoolboys and schoolgirls to deal with. For the boys, the good mother must quietly let loose the apron-strings, or expect

to have them broken. For seven years, her eye may follow wistfully her schoolboy, with "satchel and shining morning face," as he moves off, willingly or unwillingly, to school. The manner of his going, by-the-way, will depend very much upon how the school is conducted. He ought to have seven years for mental and physical culture, with a fair allowance for each. His little sister ought to have the same. By the time the two reach the next climacteric, or fourteen years, he ought to be prepared for special or technical education, which is to fit him for his life-pursuit. The girl will be about entering upon early womanhood, and too much care and consideration cannot be bestowed upon her.

We will suppose the boy and the girl to be entering now upon a seven years' term of preliminary or primary school education. They are to learn not everything, *omne scibile*, indeed, as unwise friends may wish, but certain elements upon which the most useful parts of human knowledge may subsequently rest as upon a stable foundation.

One of the most highly-educated of our countrymen used the following language: "To read the English language well, to write with dispatch a neat, legible hand, and to be master of the first four rules of arithmetic, so as to dispose of, at once, with accuracy, every question of figures which comes up in practice—I call this a good education. And if you add the ability to write pure, grammatical English, I regard it as an excellent education. These are the tools; you can do much with them, but you are hopeless without them. They are the foundation; and, unless you begin with these, not with flashy attainments, a little geology, and other ologies and osophies, are ostentatious rubbish."—(Edward Everett.)

We venture to say that it is but a minority of college graduates, male or female, especially of the former, who could give proof of possessing Mr. Everett's *excellent education*. If not acquired early it is not acquired at all; and

students go on to ologies and osophies who are by no means well grounded in such elementary acquirements as reading, writing, grammar, geography, and arithmetic. Parents and teachers are anxious to push the pupils to higher studies, prepared or not prepared. They push the precocious pupils ahead, and let others follow as they may. The bright ones, over-bright perhaps, are always exhibited to examiners as specimens. But it is a common remark, "That child is too bright to live long;" and this indeed has been a proverb among many nations: "*Præcocibus mors ingeniis est invida semper;*" and sometimes, we must fear, the precocity is the *cause* of the early death.

For those not likely to have any ultimate use for foreign languages, living or dead, seven years is not too much to give to acquiring a good *English* education. If the cramming process must be undergone, let it not begin before the child has reached the second step of the ladder, or fourteen years. The elder Disraeli, indeed, says that there is no good study before twenty; and doubtless the best is done much after that time. A book of clever French caricatures, "Le Diable à Paris," exhibits one of a row of students whose heads are emerging through their desks, heads thrown back and mouths wide open, in each of which is a funnel, and into every funnel a learned professor is forcing, not one, but many forms of learning—Latin, Greek, Hebrew, moral and natural philosophy, *belles-lettres*, fine arts, and polytechnics of all sorts. The artist shows us the modern process of *cramming*, but he does not tell us how such meals are to be digested. Neither himself nor the professor vouchsafes any explanation of this important matter.

Girls often learn the elements better than boys, for several reasons. In the first place, they have generally less to learn. Their studies are less varied. And, secondly, they are frequently brighter and quicker and always more docile than boys. They are fonder of approbation; more fearful

of disapprobation. Bad marks on paper are more terrible to them than flesh-marks are to their often obstreperous brothers. But then girls are more apt to suffer for their very docility. They will go to bed at night hungry and exhausted, mind and body, and purblind, from reading and writing by gaslight, rather than take reproof on the morrow for faulty exercises or lessons. We have repeatedly seen girls injured by excessive efforts to keep well with their classes and to obtain promotion. Of course, study is not the sole evil. Confinement in-doors, when they ought to be out, constrained positions, mental tension, and mental anxiety, are all factors in undermining the future woman.

During the whole school-term there should be abundant recreation, and more physical than mental exercise. Nature requires it, and we may not safely defy her laws. Roger Ascham thus urged: "To omit study for some time of the day, and some time of the year, maketh as much for the increase of learning as to let the land lie some time fallow maketh for the better increase of corn. . . . And surely the best wits to learning must needs have much recreation, and ceasing from their books, or else they mar themselves, when base and dumpish wits can never be hurt with continual study; as ye see in luting, that a treble minikin string must always be let down, but at such time as when a man must needs play, when the base and dull string needeth never to be moved out of his place. . . . And even so, I am sure that good wits, unless they be let down like a treble string, and unbent like a good casting bow, they will never last and be able to continue in study. And I know where I speak this, philologe, for I would not say thus much afore young men, for they will take soon occasion to study little enough. But I say it therefore because I know, as little study getteth little learning, or none at all, so the most study getteth not the most learning of all. For a man's wit, fore-occupied in earnest study, must be as well recre-

ated with some honest pastime, as the body, fore-labored, must be refreshed with sleep and quietness, or else it cannot endure very long."

If a clever man must be let down like a treble string, how much more necessary for the half-fledged man or woman, the schoolboy or schoolgirl! The learned clerk, just quoted, takes care withal to put in a saving clause in regard to young men, or boys, who indeed are not very apt to damage themselves by hard study, however much time they may waste in the schoolroom.

Persons who have not given attention to the matter have very little idea how much time is wasted in the schoolroom. The young mind, as the young body, soon becomes weary, and will not bear prolonged strain. Six hours in the schoolroom, and three hours at home given to preparation, making nine hours a day for brain-work, is far too much for the young brains of growing children. If carried out, they are injured by the work; if not carried out, they are still injured by the confinement. We say nothing at present of probable objections to the schoolroom itself. We are asserting directly that children cannot undergo nine hours daily of brain-work without detriment, and that both to body and mind. The subject has been carefully investigated. Mr. Edwin Chadwick, who is second to no authority upon this matter, found as the result of methodical observation that young children could not keep up voluntary attention to study beyond two hours in the morning and one in the afternoon. "By force, even, they cannot get more than one additional half-hour of real attention, and that half-hour proves in the end a *mental mischief as well as a bodily injury.*" He found that *half-time* children learned as much habitually in the schools as *full-time* children; that is, those who gave three hours to study learned fully as much as those who gave six hours—we will not say to study, but to school. The half-time children came from the factories. "*As they gain in bodily condi-*

tion by the reduction of their physical labor, so do they in mental condition by the reduction of the time devoted to mental labor."

The passage which we have italicized is very significant. It merits great consideration. It gives prominence to the fact that mental and physical occupation ought to bear due proportions to each other, and that the welfare of the child depends upon the observance of these proportions. It is equally wrong to exhaust young vitality with too much body-work or too much brain-work. We have spoken so far only of mental education, but there is another kind referred to in speaking of the reduction of physical labor. Of children in factories, an observant physician, Dr. Kay, of Manchester, England, says: "The employment absorbs their attention; their persevering labor must rival the mathematical precision, the incessant motion, the exhaustless power of the machine. These *patients* lose flesh; their features are sharpened, the skin becomes sallow, or of the yellow hue which is observed in those who have suffered from the influence of tropical climates. The strength fails, the capacities of physical enjoyment are destroyed, and the paroxysms of corporeal suffering are aggravated by deep mental depression."

In a parliamentary examination the following is a specimen of question and answer: "*Question.* Were the children excessively fatigued by their labor? *Answer.* Many times we have cried when we have given them the little victualing we have to give them. We had to shake them, and they had fallen asleep with the victuals in their mouths many a time."—(From "The Body and the Mind," by Dr. Moore.)

This cruel treatment has been, of late years, we believe, considerably modified, and the factory-children in some instances have opportunities of resting the body while improving the mind, the very existence of which, to generations of them, was almost entirely unknown.

The children often, it seems, could not eat their crusts, from physical exhaustion; and schoolgirls, as we have said, have often failed to take their meals on account of excessive mental tension. Extremes meet; and where extremes are harmful they should be avoided.

Supposing the capacity for study to be equal, on the average, to three hours daily, as stated by Mr. Chadwick, three hours more might be given to school, with recesses, and going to and fro; that is, one-fourth of the day might be allotted, not altogether to study, but to school, with recitations, and intervals for recreation, and inspiring oxygenated air out-of-doors. No matter how excellent the school department, it should be vacated at short intervals. Air may be very insidiously changed. Dr. B. W. Richardson says: "In another series of experiments I learned that, if oxygen were freshly made, and passed in the fresh state through a chamber in which living animals were placed, the animals would continue to live. But, if the oxygen that had swept through the chamber—although it were thoroughly purified of animal products, and although it still appeared to be absolutely pure oxygen—were used again, it failed to sustain life until it was subjected to the action of the electric spark, when it regained its activity. I infer from these observations that oxygen may exist in the atmosphere in an inactive condition, not inducing necessarily acute disease, but depression of mind, languor, torpidity, and cachectic feebleness of body."—("Diseases of Modern Life.")

We may equally infer that in the schoolroom, where the oxygen *must* become vitiated, a new supply should be let in abundantly at very short intervals, besides what may be let in by methodical ventilation while the children are in the apartment. It would brighten their wits, as well as improve the physical condition, to give them fifteen minutes in the open air at the expiration of every hour in the schoolroom.

This relief would tend to save them from the morbid condition just stated by Dr. Richardson.

We may now pass on to the third climacteric term, from fourteen to twenty or twenty-one years—*canamus paula majora;* and, *inter alia*, we may take a summary view of the very important subject of school-hygiene.

Section 5.—Youth.—Progressive Education.

"Should the body sue the mind before a court of judicature, it would be found that the mind would prove to have been a ruinous tenant to the landlord."—Plutarch, quoting an ancient philosopher.

The boy or girl of fourteen ought to be sufficiently educated to enter upon the special course or courses applicable to the future career. The boy may go to college, to the polytechnic, or directly to business. The girl may begin to make her special preparation for her probable destiny. She will presumptively be man's helpmeet; but she ought to be more or less prepared for taking care of herself, which may be a necessity, with or without marriage.

Physical and mental development now go on rapidly, and the capabilities increase in a corresponding ratio. Higher faculties now come into use. The one mental faculty most exerted hitherto has been the *memory*, acquisition, or retentiveness; now, the powers of *discrimination*, or consciousness of difference, and *similarity*, or consciousness of agreement, will be brought into more active exercise. To use other language, will, memory, and judgment, are to be at once trained, developed, and regulated. The mind will not be a ruinous tenant except by faulty construction or faulty management. There is danger, indeed, of making too much of the intellectual, at the expense or to the neglect of the moral faculties, and thus the mind may indeed become a ruinous tenant; but this is simply because of misdirection.

The intellect is not everything; the whole being must

be educated, and with well-considered design. If the preceding seven years at school have been well directed, a youth of average capacity will be equal, if need be, to self-culture, whatever may be his pursuit. If he have the innate force, he may become another Dr. Franklin. If he have indifferent mental capacity, and little aptitude for learning, he may go through a college course, learning almost nothing, and then enter one of the learned professions, to swell the number of the low grade of *hoi polloi* ministers, and doctors, and lawyers, who are but ill qualified to take care of the spiritual, corporeal, or legal interests of their fellow-men.

From fourteen to twenty-one, then, boys ought to be educated to and for their business, and in accordance with their fitness. The same may be said of girls; though their term should be shorter, and the exactions much less. The idea of educating girls, or young ladies, as we may now call them, exactly as boys, or as young men, is an ephemeral folly that will soon correct itself.

Everybody ought to be educated, but this does not imply a whole nation of scholars or of bookworms. Such a nation, it seems, was discovered by a traveler in Laputa. All were famous scholars, and all arts and trades were carried on exclusively by scholarship. The methods used in farming, says the veracious traveler, "were to me wholly unaccountable, for, except in some very few places, I could not discover one ear of corn or blade of grass." One learned scholar had been engaged for eight years upon a project for extracting sunbeams out of cucumbers. He expected soon to illuminate the governor's gardens at a reasonable rate —the only drawback being the high price of cucumbers! Another profound scholar was hard at work to calcine ice into gunpowder, and was writing at the same time a treatise on the malleability of fire.

Everybody ought to be educated, indeed, on a common plan for the groundwork, and on a special plan for the su-

perstructure or for the business of life. To keep youths at books from fourteen to twenty-one without special object is to incapacitate many of them for practical business pursuits.

Every community wants thinkers, it wants workers, and a strong and vigorous race of men and women. When the *physique* is destroyed or impaired, as it so often is by protracted study, or rather by protracted schooling, which is a very different thing, the intellectual culture is about as good as seed cast upon a barren soil. A writer in the *Home Journal* says: "A weak mind in an herculean frame is better than a giant mind with a crazy constitution. A pound of energy with an ounce of talent will achieve greater results than a pound of talent with an ounce of energy. A man without health may be a giant in intellect, but his deeds will be the deeds of a dwarf."

Sound sanitation aims to keep mind and body both in the best working order; and this is only to be accomplished by keeping both sufficiently and duly exercised, and with due regard to their respective capabilities. In ancient Athens, in her palmiest days, intellectual, æsthetic, and gymnastic training went together in the curriculum, and modern wisdom should rehabilitate this combined method.

A writer (Dr. Oswald) in a late number of the *The Popular Science Monthly*, on the "Age of Gymnastics," gives undue prominence to the development of the physical man. Such doctrines as he would promulgate would tend to make athletes, indeed, but this is going beyond the true desideratum. "How many of the most admirable character-traits of the ancient Greeks, and how much of their success in the arena of life, may be distinctly traced to these sources of mental and physical health! Health, in the widest sense of the word, was indeed the primary characteristic of their age, for health and vigor are synonymous. The same process of adaptation that qualifies his body for the performance of athletic feats disqualifies it for the development of any morbid elements, and accelerates the elimination of

effete matter from the organism. We accordingly see that, among the creatures of the wilderness whose normal condition is one of muscular vigor, disease is wholly abnormal, and premature death only the consequence of wounds or protracted famine."

He gives some apocryphal instances of the powers of ancient athletes with approbation. "Polydamus was able to fracture the skull of a steer with a single blow of his fist, and tamed a wild horse by catching the hoofs of the hind-legs, which he twisted inward till the joints of the fetlocks creaked whenever the animal attempted the least rebellious movement."

Many youths of the present day have a morbid admiration for bruisers and boxers, and other athletes; but such heroes are not models for imitation. Good health by no means demands great physical prowess. It demands only so much bodily exercise as may be necessary to keep the bodily functions in good working order. Young men may be as readily wrecked by violent bodily exercise as by excessive mental labor. This we have seen illustrated under our own observation.

Neither body nor mind should be overdriven in early life. To return briefly to brain-work, we may say, with Dr. Allbutt ("On Brain-Forcing"), that the health of the brain and the nervous system, upon which the abundance of its fruit depends, is closely related to the tone and activity of the rest of the corporeal frame. The volume of force issuing from the brain is largely dependent, for example, upon the power of the stomach and allied viscera, upon the power of rapidly digesting and assimilating an abundance of food, and of breaking up and excreting spent material.

But children are not to go back to "the freedom of the wilderness." "No mistake," says Dr. Allbutt, "is more fatal than that of parents who let children run wild, on the pretense of physical development. This, indeed, they may obtain, and how guarded we are to be in forcing the brain

I need not say again ; but there can be no misfortune to a child greater than to escape the life of justice, order, and rule, or to escape the training of those perceptions of social needs and social laws which, when graven in our ganglia and long current in our nerves, become habits of sympathy, charity, and self-sacrifice. Herein I fear that the partisans of 'secular' education are greatly at fault. Children may be trained in board-schools to habits of cleanliness and order, but they are not trained in the principles of liberty, nor are their eyes turned to the sanctions of religion. From this system I fear there may be a sad awakening for a coming generation."

Another passage from this writer is of general application : "Control is eminently a creature of education, and is perhaps the most precious gift of the individual man. Without justice, temperance, and definite industry, the most brilliant attributes of mind may be impotent for good, and without the habit of social subordination and the bond of social sympathy, the most brilliant society would be but a rope of diamonds. Brain-forcing is terribly mischievous. It urges genius into precocious fruitage ; it drains the springs of nervous force, it excites high tension without giving volume to fortify it, it stints the variety of mental expansion, and by enforcing control it breaks the spirit. The true purpose of education is, first of all, to teach discipline—the discipline of the body, and the higher discipline of the mind and heart."

If the intellect be solely cultivated, the "most brilliant attributes" are often worse than impotent for good ; they are exceedingly potent for evil both to the possessor and to society at large. A great intellect highly cultivated, without moral and religious restraints, is one of the most dangerous powers that can be intrusted to human use or misuse.

> ". . . There is a learning unrefined,
> That oft enlightens to corrupt the mind."

Let us now turn to a consideration of the education of the gentler sex, which is certainly not less important, though it may be less comprehensive, than that given to boys. The girl of fourteen, now a good English scholar, will presumptively be learning some accomplishments ; it may be music, dancing, drawing, and one of the modern languages. She will probably learn something of the natural or mechanical and something of the moral sciences. But a rigid system of study at this time of her life, even so much as may be admissible for boys of her own age, is not safe for her. The ambition, now somewhat wide-spread, to put her through a boy's course, as if she were intended for manhood and not for womanhood, is a fatal one. Physical incapability for the fulfillment of duties likely to devolve upon her hereafter as wife and mother, is a common penalty for this unwise ambition. In intellectual competitions between boys and girls it is true girls often carry off the prizes. The average girl is commonly quicker-witted than the average boy, and she will run away from him, like Atalanta from her lovers, unless something diverts her from her course. But the competition, for her sake, should never be entered upon.

There is a whimsical account in the *Spectator* of a republic of women, where the girls were all brought up for the work of men. They learned to box and play at cudgels ; they were taught to ride the great horse, to shoot, dart, sling, and to perfect themselves in military exercises. No woman was to be married until she had killed her man. The ladies used to play with young lions instead of lapdogs. Blushes and sighs were prohibited. The face that had the most scars was looked upon as the most beautiful. But, after all, the republic was a failure, and, although young ladies still kill their men, they generally manage mercifully to bring them to life again.

Now we would substitute calisthenics for military exercises, and, when practicable, our *protégée* should have a

palfrey instead of a great horse for daily exercise. There is no sensible man living who does not wish his daughter to be a well-educated and intelligent woman. But there are many who, from want of knowledge, see their hopes frustrated on account of mismanagement while the girl is obtaining her education. A very instructive work, entitled "Sex in Education, or a Fair Chance for the Girls," from the pen of Prof. Edward H. Clarke, was published a few years ago by J. R. Osgood & Co., of Boston. The professor raises no question as to superiority or inferiority between the sexes, but he urges that physiological differences must be respected. During her school-days the girl is passing through the most critical change of her life, and, in developing womanhood and establishing a new function, the vital powers are severely taxed. If her vital forces be then "properly nurtured and cared for, they are a source of strength and power to her. If neglected and mismanaged, they retaliate upon their possessor with weakness and disease of the mind as of the body. . . .

"It has been reserved for our age and country," he says, "by its methods of female education, to demonstrate that it is possible, in some cases, to divest a woman of her chief feminine functions; in others to produce grave and even fatal disease of the brain and nervous system; in others to engender torturing derangements and imperfections that embitter a lifetime. Such, we know, is not the object of a liberal female education."

The true friends of the gentler sex must not be misled by any faction-cry. It is an important part of "women's rights" that their physical health shall not in their youth be sacrificed to mental attainments, which, with broken health, will be of little use to them or to society.

Dr. Clarke made inquiries of some of the professors in Western colleges, where *co-education* of the sexes is adopted, as to its workings. Some of these gentlemen replied candidly that this experiment was "intellectually a success,

physically a failure." The experiment, then, is a failure, as every hygeist would suppose beforehand.

"The fact is now generally admitted," says Prof. Bain ("Mind and Body"), "that thought exhausts the nervous substance, as surely as walking exhausts the muscles." Young people are generally said to be *thoughtless;* and, indeed, they are no more fitted for grave or exhausting thought than for heavy or exhausting physical labor. It is especially wrong to exhaust the girl's nervous force when she has such special need for it.

An accomplished physician, who has taken a great deal of pains to get up positive information on the important subject of *vital statistics*, shows a deplorable failure of the standard of health among New England women, who probably have more schooling than any others of their sex in America. Since they have given up employments which chiefly exercised their muscles for mental pursuits, they show, instead of a good development of the muscular and lymphatic temperament, a great predominance of *nerve-tissue*, so that the constant demands of the brain are far greater than the physical system as a whole can bear. "The condition of all the organs and their functions is impaired, the nervous system being often in a capricious or morbid state. These physical changes, extending to the brain, involve certain changes of character, and have an important bearing on domestic life."—(Dr. Nathan Allen, in *The Sanitarian*, June, 1877.)

This careful statistician shows, at some length, what great practical evils to the individual woman, and to society, result from faulty education, that is, in its most comprehensive sense. Mental pursuits, the fashions of the day, the artificial habits of society, and the luxuries of modern civilization, with other causes commencing in early life, are all factors in impairing the stamina of the constitution, and in perverting the harmony or balance of organization.

This mismanagement of early life unfits the girl for her

future duties. If she become wife and mother, statistics unfortunately prove her unfitness for her sacred trust. If she have children, as the writer has seen in practice, as a derivative from her own nervous disorganization, her children are eminently liable to convulsions or multiform neuroses.

"Without wealth of bone and blood," says Dr. Allbutt, "volume of nerve-force will dwindle, and the rarest quality may fail of proof, or lose its splendor. Before women can hope to do hard and high work, sense must expel sensibility, and schoolgirls must cease to walk out in a row, to veil their faces, to wear stays, and to eat delicately."—("On Brain-Forcing.")

In a recent number of *The Popular Science Monthly* (June, 1878) appears an editorial on the "Study of the Brain," in which there is a commentary upon the studies at the Jersey City High-School. "The course of study is of a high grade," and, as the principal tells an interviewer, "girls can master the higher branches of education far more readily than boys." They work hard for it, and a fatal ambition is stimulated. "School-work," says the editor, "becomes a steady pull in these directions, with no time for reflection or observation, or independent exercise of thought upon the subjects chosen. The system affords no check against overdoing. The teachers push on those who should be held back, and, if they do not break down and die outright, no harm is recognized. The idea that pupils, girls especially, can be sustained by excitement and carry off the honors in apparent health, while their constitutions are undermined, ill-health entailed, and the power of vigorous accomplishment through life destroyed, seems hardly to enter into the minds of educators. It is one of the fruits of our dominant high-pressure, machine systems of culture, that the mass of teachers and of education journals pooh-pooh the notion of overwork in school."

Other fruits are thus stated in the report which gave

occasion to the commentary. "Of these female graduates, two bright and promising young women died in early womanhood, one is now an inmate of an insane asylum, and two or three others are said to be in delicate health."

When the writer offers his opinions, and a few vouchers, in regard to female education, it is because he is its earnest advocate, not its opponent. He only insists that it must be in accordance with, and not in opposition to, sound physiology, or, in other words, to the very nature and condition of women. In the "freedom of the wilderness" the attributes of the body are alone respected; in high civilization, some seem to think the mind alone worth culture. There is a *juste milieu*, which is the true course for the preservation of the mental and physical integrity of our countrywomen.

We would wish to see our women models of good education, in all things becoming to them: in religious, moral, intellectual, and physical culture. We can agree with Sydney Smith when he says: "The education of women favors public morals; it increases the pleasures of society by multiplying the topics upon which the two sexes take a common interest, and makes marriage an intercourse of understanding as well as of affection by giving dignity and importance to the female character." But, withal, the female character is and ought to be indelible, and the best education for women must always be conducted with due regard to this particular fact.

Section 6.—The Schoolhouse.

It would be a great saving of "Young America," and thereby of all America, if every schoolroom in the land, public or private, were subjected habitually to the official inspection of a medical examiner. Inspection, with authoritative correction of hygienic mismanagement, would make an immense addition to the sum of health and happiness of the American people throughout the whole republic.

Most schoolhouses are defective in matters of light, ventilation, and warmth, and in regard to certain appendages which should not only not be ignored, but which should have special care for many reasons.

In some schoolrooms there is at times an intolerable glare of light in the pupils' faces ; in others there is a want of light, the whole apartment being sombre and gloomy. In very many the light falls in all sorts of irregular directions. These things are very trying to the eyes of the pupils, often doing them serious injury, besides affecting the general health. The writer has seen this matter so often ignored that he was particularly pleased, in passing through the rooms of the Maryland State Normal School, under the intelligent management of Prof. M. A. Newell, the principal, to find that in all cases the light came uniformly from the left side upon the desk of every pupil. Any student or writer will be at once impressed with the advantage of this arrangement.

If the schoolroom be not well ventilated, the children are poisoned by the foul air which they are compelled to breathe over and over again. But ventilation requires scientific care. When a crowded schoolroom becomes close and hot during the winter, windows are often opened to let in fresh air, which indeed is a necessity, but then direct draughts falling upon the children while overheated, and probably perspiring, with powers of resistance already lowered, are likely to produce acute inflammatory diseases, in lieu of the chronic poisoning otherwise being engendered. Proper arrangements let in fresh air perpetually, and let out foul air ; but these are never quite adequate, and, to supplement deficiencies, the rooms should be often *vacated* and aired.

"A due supply of unadulterated air," says Dr. Bell ("Schoolroom Stunting," in *Sanitarian*), "to the respiratory organs is recognized as among the most important conditions of health at all ages and under all circumstances, but

at no age is this so essential as during childhood. Air vitiated by respiration is not only known to be among the most active influences in promoting the spread of many fatal diseases, but on children who may escape these diseases it exercises a powerfully depressing influence. A person consumes about two gallons of air every minute, or one hundred and twenty gallons per hour; and every pulsation of the heart decomposes nearly a quarter of a pint of air. Hence it follows that if the air remains subject to re-respiration, or is not supplied with a due quantity of oxygen, functional activity is obstructed, nutrition is interfered with, and the sensibilities are blunted; the brain of the child is filled with impure blood, and is not only itself depressed, but through it the whole organism is deranged; and although life may not be speedily destroyed in extreme cases, the intelligence is stunted and mental capabilities overthrown."

Thus a foul, crowded, ill-ventilated schoolroom defeats the objects for which it was designed; it injures the mind as well as the body. It is no wonder that the observant editor of *The Sanitarian* speaks of the "hollow-eyed, bleached, and feeble progeny of the schoolroom; they have no stamina—hot-house plants destined to perish on the very threshold of life."

The warmth of the schoolroom should be regulated by the season, and even by the day. A pleasant temperature will not vary far from 70° Fahr., and, if volumes of hot air come through a flue, the air ought to be softened by the aid of a little watery vapor. The lighting and extinguishing of fires for the cold months should not begin by and end in exact accordance with the almanac. A depressing degree of cold, though a month before the usual time, should be counteracted by artificial warmth; and so when the winter fires have been stopped for the season, upon cold and wet days they should be temporarily rekindled. Exposure to cold air is usually beneficial to children, when its influence

is met by active exercise ; but *passive* exposure to cold is extremely trying, and they should not be subjected to it.

There are certain important appendages to the schoolroom which should be kept rigidly clean, and so arranged that no effluvia therefrom shall ever permeate the part of the house occupied by the scholars. Every compartment should admit of one person only at a time ; and this is said at once in the interests of health and of morality.

Withal, the schoolhouse should have a bright and cheerful look, with plentiful sun and air, and, if possible, play-grounds. In the absence of grounds, a level floor on top of the house, properly guarded, would serve for transient recreation.

We have spoken of education as if it were the sole business of the third climacteric term ; and so indeed it is, but the most useful education is not confined to school or college.

"The many must live by labor," says Prof. Newell, "and the school must help them to live. No longer must the primary school be looked on as merely the vestibule to the high-school, which in its turn is but the antechamber of the college ; but the public school in all its departments must be regarded as the turnpike-road, from which the travelers may step at once into the farm and the workshop." Their education is continued then on the farm or in the workshop, and generally this conduces to their own health as to individual and national prosperity. The professor makes also the practical remark that no one's education can be regarded as finished, even in the most limited sense, *until he knows how to earn a living for himself.*

Whosoever wishes to see details about schoolrooms, their defects and requirements, may find them very fully exhibited in the proceedings of the Medico-Legal Society of New York, published in *The Sanitarian*, and in many articles from various writers in that valuable periodical.

The writer will only add now that many times, when

such a disease as pulmonary consumption appears *de novo*, and is repudiated by the friends in its incipiency as "never having been known in the family," its origin may be found, not indeed in heredity, but in the foul air of the school-room, and the innumerable hygienic errors which are unwisely, if not criminally, allowed to exist as concomitants of education.

Section 7.—Physical Exercise.

Physical culture must become a constituent part of education for both sexes. The brain, or rather the whole nervous system of man, is the organ and exponent of his intellect. The integrity of this system cannot be permanently maintained otherwise than *in corpore sano*. Neither mind nor body will have vigor without due exercise. Both should be well worked in youth, but still within prudent limits. Either or both may be prematurely exhausted.

Exercise for health should be as much out-of-doors as may be conveniently practicable. But gymnastics and calisthenics in-doors are also advantageous. A student or clerk, when weary of mental work and physical rest, may gain great relief by a few minutes' use of dumb-bells. It is no object to have these very heavy. The writer has had to stop young men from the violent use of heavy dumb-bells, because of the evident harm resulting from such use of them. It is a question whether rowing-matches do more harm or good to the physical man. What is certain is that *violent exertion* is by no means necessary for the best hygienic results. It must be remembered that most professional athletes become *stale*, even if they do not die young.

Physical culture is indeed a necessity, but, like mental culture, it requires scientific training.

Dr. Bowditch made extensive inquiries among presidents of colleges as to the physical culture of the students, and where it was made a matter of attention, and he gives brief

extracts from letters received as to its influence, as follows: "The pupils gain 'good' health, 'more vigor,' 'increased strength,' 'very high rate,' and 'even correction of physical defects.' One says, 'Dyspepsia and debility, formerly prevalent, have gone;' another, that 'those exercising regularly, if well, keep well; if weak, get better, and escape diseases usually incident to student-life, coming out fresh and strong.' '*Physique* of Western students almost always good.' 'Many students neglect exercise, and need hygienic advice.' 'Manly carriage and womanly grace, and agility in both sexes, promoted.' 'Military drill, especially for these last qualities, is good.' 'The *morale* of the exercise is good, and the tone of the student is improved.' In one 'the moral effect was more marked than the physical.' On the contrary, one says that the moral effect may be bad with a low-minded superintendent."

The first necessity, in the case of the low-minded superintendent, would be to remove him, or to withdraw every respectable youth from such wretched guardianship.

"Very few of the colleges," says Dr. Bowditch, "compel any kind of physical exercise, or encourage it, as any university should encourage every means tending to a perfect manly and womanly development. I can but hope that, during the coming century, a better course will be followed."—("Hygiene in America.")

This matter is now fortunately claiming so much of public attention as to insure, we may trust, a methodical concurrence in the future of physical with mental training.

The subjoined letters, from thoroughly competent observers, go far to sustain the advantages of conducting *pari passu* physical with mental culture:

I.—Letter from Dr. Harmon, U. S. N., in charge during the absence of Dr. Gihon, to Prof. Richard McSherry, M. D., Baltimore.

Question 1. What time is given daily to physical training, and what to study, with the cadets at the Naval Academy?

Answer. The time devoted to daily recitations and study is divided into four periods:

1. From 8.30 A. M. to 10.30 A. M.
2. From 10.45 A. M. to 12.44 P. M.
3. From 2 to 4 P. M.
4. From 7.30 P. M. to 10 P. M.

This last period is without recitations, and one hour of it is occupied every evening by one of the four classes in boxing, fencing, dancing, or other exercise in the gymnasium.

From 4 to 5.30 every afternoon are drills in infantry tactics, great guns, seamanship, or boats, in which all the cadets are obliged to participate. Three days in the week a portion of the second period, from 10.45 A. M. to 12.45 P. M., is occupied also in one or another of these drills.

On Saturday they have recitations and practical exercises for the second. The afternoon is a half-holiday.

Question 2. Is the health of the cadets promoted or impaired by the academic course?

Answer. It is undoubtedly promoted.

Question 3. Are any forms of disease developed, or any tendencies thereto arrested? State the facts as they appear to your observation.

Answer. During the time of my service at the academy I cannot discover that any peculiar form of disease is traceable to the course of study and training pursued here. The cadets are admitted between the ages of fourteen and eighteen years, after being submitted to a careful and thorough physical examination. Thus we have to do with a body of healthy, well-formed boys. Our sick-list comprises, in nine cases out of ten, simple ailments, such as slight derangements of the digestive functions and trivial injuries.

During the session, we have a number of cases of functional eye-trouble, caused by the strain upon the organs of sight from night-study by gaslight.

As all candidates showing any decided tendency to disease of any kind are rejected, we have no opportunity of observing the effect of the academic course upon persons of that class; but from the marked improvement in the appearance of those cadets who were not among the best physical specimens upon entry, and the robust, finely-developed young men who compose her graduating classes, almost

without exception, I do not doubt that the four years' course at the Naval Academy is well adapted to arrest any and all tendencies to disease and faulty growth which owe their cause and progress to the want of proper attention to physical training at this time of life.

Question 4. Do the cadets use tobacco in any form; and if they do, is there any appreciable effect from its use?

Answer. The use of tobacco by the cadets is prohibited. . . . As a complete answer to the latter part of this question, I inclose herewith a printed copy of a report upon this subject made by a board of medical officers appointed by Admiral Rogers for that purpose.

Question 5. Do the cadets use wine, beer, or ardent spirits, in any form; and if they do, is there any appreciable effect?

Answer. The use of all of these articles is forbidden.

(Signed) GEORGE E. H. HARMON, P. A. Surgeon, U. S. N.

UNITED STATES NAVAL ACADEMY, ANNAPOLIS, *August* 27, 1878.

II.—Letter from General FRANCIS H. SMITH.

VIRGINIA MILITARY INSTITUTE, *August* 28, 1878.

Richard McSherry, M. D., Baltimore, Maryland.

DEAR SIR: The surgeon provisionally in charge of the Virginia Military Institute Medical Department has referred to me your letter of the 22d inst., for the information sought by it.

I have been in charge of the Virginia Military Institute for nearly forty years, and I can give you the result of this large experience.

The tendency of the academic course in any college is to impair the health of a close student. One of the objects sought by the military drill and discipline here is to enforce hygiene in the whole life of the student, and to combine the military drill as a means of developing the physical frame, and of giving regular exercise. The benefits resulting from this system are manifestly observed every year.

I have a son now pursuing his theological studies in a theological seminary. He had graduated at the Virginia Military Institute after a four years' course here. He told me the debility of his seminary fellows was so marked in contrast with his own vigor,

although himself of a delicate frame, that he was enabled to do twice as much mental labor as they.

Young men predisposed to pulmonary disease often come here for the physical training. We have now a case in the school who had a dreadful cough when he came—no appetite, and some spitting of blood. He is developing into a sound man.

This pulmonary tendency is checked; the chest is developed, and digestion regulated.

Many boys have debilitating losses. This infirmity is checked, and indeed controlled.

Tobacco is used, although prohibited. We regard it as injurious, and do all we can to check its use. No spirituous drinks are allowed. Yours respectfully, etc.,

FRANCIS H. SMITH, Superintendent.

The author begs leave to call attention especially to tendencies checked as indicated in the above instructive and suggestive communication. It conveys a most useful practical lesson to parents and teachers.

BALTIMORE, *September*, 1878.

CHAPTER III.

THE YOUNG MAN.—THE YOUNG WOMAN.

Section 1.—The Young Man.

"There is so much to win, there is so much to lose."

From twenty to forty years of age the man is maturing, physically, mentally, and morally. The collegian, at about one-and-twenty, comes to the end of his college course, on what is called commencement day. Collegian or not, he is now to start out on a life of comparative independence; and he has a commencement day, or time, which, in his career, is eminently critical. He rarely understands or believes in the perils by which he is surrounded. He bursts, as it were, from the egg-shell, which has confined him so far, upon the great world, where

"Love, Hope, and Joy, fair Pleasure's smiling train,"

are awaiting to welcome him. He is in danger of believing, with Epicurus, that pleasure is the sovereign good; but he rarely understands, with that philosopher, that pleasure, to be enduring, must have its first element in self-control—in mastery of the passions, and not in subjection to them.

He ought to begin with hope; it is a well-spring of health and happiness. But, in point of fact, our young men, with few exceptions, soon find cares—it may be corroding cares—pressing upon them. If rich, they can rarely avoid being led into evil courses and the ways of danger. If poor, they find themselves soon engaged in a struggle for existence, which, to sustain the man's estate, requires the

man's abilities. The mind and the body are now attaining to their fullest capabilities ; and the young man may, must, and ought to, work up to them. His brain gets its full development ; his physical frame, just having attained to its height, now expands in other directions. If not "stunted" by previous mismanagement, nor damaged by overwork, nor incapacitated by idleness, he is presumptively ready for his allotted work. If farmer or artisan, he is ready for the "plough, the loom, or the anvil," and in his pursuit he shows and is the man. Who was more man than Gabriel Lajeunesse, unless it were, indeed, his father, Basil the blacksmith? If he live not by the work of his hands, but by trade, or by letters, or by the learned professions, or by the arts or the sciences, he finds the avenues all closed, entrance difficult, and advancement still more so. Surely the imagined independence of manhood has for most young men many drawbacks. Being, however, in the current, he must swim or sink. His good education, which has given knowledge to his mind, strength to his body, and force to his moral character (unless it has done so much, it was not good education), now proves its usefulness.

In selecting his pursuit it is to be presumed that he has taken one not incompatible with physical health or moral integrity. Some callings are adverse to the one, some to the other, and some to both. Almost all occupations have some particular bearing upon the well-being of the individual, and so has the manner of pursuing them. Physicians, for example, as a rule, are shorter-lived than men of other learned professions. They know, indeed, what hygienics require for good health, as regular sleep, regular meals, regular habits of exercise, and regulated study. They know the dangers of foul air in the sick-chamber, the hospital, the swamp, the pathological room. They work hard, too hard frequently, with mind and body, lose rest, and encounter infection with a full understanding of what may befall them, not in ignorance of the danger. Thus it may

be, and has been said of them, truly : "*Aliis inserviendo consumuntur ; aliis medendo moriuntur.*"

Unfortunately, many industrial pursuits are in themselves unfavorable to health and longevity : the miller, the baker, the stone-cutter, the tailor, the dressmaker, the shoemaker, the printer who is at work nearly all night on the morning paper, and many others whose labors are indispensable to the good or the wants of mankind, too often sacrifice health and life in the service of their fellows. The life of the soldier or sailor is not more imperiled than theirs. The primitive man was gardener, herdsman, hunter, and he led to a great extent a free life in the open air. If he had been suddenly captured, and confined in a close workshop, he would soon have pined away and died like those wild birds shut up in cages, which die where older captives at least endure existence.

As we cannot go back to primitive habits, and as we must all have our daily bread, and clothes, and morning paper—whosoever may fall by the way—we can only trust to the sanitation of the future to remodel workshops and habits of life so as to give all benefits possible to the toiling "slaves of civilization." Most men are in the bondage, and civilization ought to be careful of its faithful servants. "*Mon devoir, à moi, c'est de conserver.*"

It was decreed that man should earn his bread by the "sweat of his brow." The great desire of the age is to live without labor. The youth regrets that he is not born to fortune ; the young man wants the easiest and the most genteel employment, if, indeed, necessity urges him to industry. These are delusions. Men who evade the decree have no reason for self-gratulation. Health, contentment, respectability, depend upon work, in some form, whether of mind or body, or both. No man will lead a contented life without useful occupation. Very often, however, a young man, when fairly in the traces, will go beyond the line of safety. He will overwork himself for ambition or gain.

He wants to be wealthy, and makes haste to grow rich. He will hurry at his meals, shorten his sleep, worry his mind with anxious speculations, and give his whole thought to addition, subtraction, fractions, interest. In a few years pecuniary success may reward him, but it will not compensate him. By the time he gets his money, he will have nothing else worth living for. If predisposed to pulmonary disease, it will be developed ; otherwise, his stomach will be a perpetual memento to him of his error. The knight of La Mancha was not hallucinated when he said the health of the whole body was tempered in the laboratory of the stomach. His nervous system will be disordered, and the idleness of acquired wealth will probably enough lead to melancholy, and melancholy may lead to suicide. It is a remarkable fact, withal, that rich men are often haunted by a spectre of poverty threatening them in advanced life ; whereas men who have known only poverty fear not the reality, much less its shadow.

It takes labor and rest, each in its proper degree, to relieve each other, and to give zest to life. They are as much corollaries as pleasure and pain.

The temptations that beset a young man are numerous and fearful. Often enough a demon besets him under the form which so troubled the peace of St. Anthony. If he withstand not the temptation, a blight may fall upon him that will make his own life miserable, and transmit the seeds of disease and death to all of his posterity.

Society with its ambitions and vanities has overreached itself. A young man with a small income fears to venture upon marriage because, forsooth, young ladies of social position require more than he can give, not indeed for the necessaries of life, but for its ostentations. Then he should seek one for a wife who is willing to share his modest fortunes, and to be to him a helpmeet. Marriage, with a good woman, is an invaluable agency in moral and physical conservatism. Of the eminent philosophers who have passed

their opinions upon this matter, two give opposite opinions, as philosophers usually do. Dr. Johnson approved of rather late marriage; Dr. Franklin of early marriage. The American was right, so far as the general rule goes. God and Nature have decreed for most men early marriage; and the young man should look to its accomplishment in the beginning of his career. The very prospect of it is conservative. When a young man sees a maiden whom he can love, and respect, and trust, he ought to let her know it, not lightly, but earnestly. Betrothal itself, where there is any moral principle, is a great safeguard.

A learned German writer says that in the ages of chivalry the true knight "bore in his heart the image of his beloved object, whether real or imaginary; and this romantic love, this indissoluble attachment, was the shield of his continence and virtue, strengthened the powers of his body, and communicated to his mind courage and unalterable resolution, by continually directing his attention to his fair one smiling to him at a distance, and whose favor could be gained only by glorious achievements. . . . The passion of love, which in those periods was a security against dissipation, is at present the source of the greatest; the virtue of chastity, the principal foundation, without doubt, of moral firmness and manliness of character, has become a subject of ridicule, and is decried as an old-fashioned pedantry. . . . Nature excites the propensity to love, not truly to afford subjects for romance or to make a figure in the ecstatic raptures of poetry, but that it may serve as an indissoluble bond to unite two hearts, to lay the grounds for a happy generation; and that, by this magic tie, our existence may be connected with the first and most sacred of all duties."—(Hufeland, "Art of Prolonging Life.")

The twenty-fifth birthday should find the young man and the young woman united for life in the holy bonds of wedlock.

Purity, mental and physical, should ever be cherished.

The writer whom we have just quoted, speaking merely as a hygeist, says the German youth of old did not contemplate marriage until the age of full maturity; "and yet nothing was known then of the pernicious consequences of this chastity, nor of many other imaginary evils of which people now dream; but these youths, increasing in strength as well as growth, became men who by their size excited the astonishment even of the Romans."

Restraints are ever necessary for the preservation of good moral or physical condition. "*Libinosa etenim, et intemperans adolescentia effœtum corpus tradit senectuti,*" says Cicero. Immoral people, of the unmarried especially, not only injure themselves, but they are capable of spreading desolation to an extent only known to physicians even throughout the best-ordered communities. They are the enemies of the human race.

The allurement of alcohol is in full activity at this period of life. It is impossible to tell how many minds and bodies are annually wrecked by its agency. Every observant medical man sees its ravages, and he sees at the same time the unreliability of statistics upon this matter. There are two sources of error: the one, that its most violent opponents use exaggerations to enforce their arguments; and the other, that it breaks down numbers of men insidiously, who are by no means drunkards, and who never scandalize the community by gross excesses. The nearest friends of these men frequently see no relation of cause and effect between alcohol and broken health, or early death, but the physician does see the relations. While preparing these pages the writer was called in consultation to see a very vigorous-looking man, a spirit-dealer, suffering with a severe attack of facial erysipelas. No one had ever seen the man drunk, though he was known to drink pretty freely; and his general reputation was good. Erysipelas, except in foul hospitals, is rarely a dangerous disease, but when the writer learned that this powerful-looking man had been

drinking whiskey freely every day for years, though he had not had at any time a day's illness, his prognosis was very unfavorable : remedies proved useless, and the man died in a few days.

When the goodly-looking ship Metropolis went to sea a few months ago, the first storm made a hopeless wreck of her. There were no outward indications of rottenness within, but it was there, and the first shock sent her to the bottom. Human wrecks of like character are familiar enough to every practising physician.

The young man who would be safe, in person, reputation, and business, should keep clear of drinking-houses. He should neither "treat" nor "be treated." If this absurd and pernicious custom were abolished, there would be very soon a marvelous "shrinkage" in intemperance and all its attendant evils.

Alcohol and tobacco will be more fully considered in subsequent pages.

As to general habits our young man should always keep some kind of parity between the occupation of the body and the mind. The clerk and the scholar should recreate by walking, riding, gardening, or using the axe ; the working mechanic or farmer should recreate with instructive books, whether relating to his own pursuits or to more general information. Many men, by-the-way, waste a great deal of time with books which might be better employed. "To spend too much time in studies is sloth," says Lord Bacon, and certainly irrelevant reading, or giving time to reading that ought to be used in action, is a very common form of sloth. Bacon also says, "There is no stand or impediment in the wit, but may be wrought out by fit studies, like as diseases of the body may have appropriate exercises." In this working world, wit is not the most valuable commodity for common use, not equal to gold, says Ovid :

> "Ingenium quondam fuerat pretiosius auro,
> Nunc est barbaries grandis habere nihil."

And in much more recent times it was George Primrose's experience that wit was less esteemed in Paris than money.

Steady, honest work, without excessive drudgery, duly alternated with rest and wholesome recreation, is the great desideratum.

Section 2.—The Young Woman.

Woman is in her glory from twenty to forty years of age. If endowed with original good stamina, and well cared for up to twenty, she is ready to take her place by the side of her stronger companion, and to enter upon the most important duties of her life.

"*Ubi tu Caius, ego Caia,*" she may say with honest pride, and without presumption. Where he is peer, she is peeress; it may be, peerless.

In regard to health-matters, married or unmarried, she ought to avoid luxurious indolence on the one hand, and overtaxing her forces, physical or mental, on the other. If she lead an industrial life, or indeed only has the ordinary cares of a household, there are times when she needs a certain amount of repose. She cannot safely keep up uniformity of any trying occupation as a man may. For physiological reasons the hygienics of her life ought to be more or less directed by her medical adviser. Taking advice under the circumstances does not imply taking medicine.

Supposing her to enter upon the connubial state, good sound health of mind and body is of the extremest importance. Her career is necessarily a trying one, even if so endowed. Though not the bread-winner, she is the central figure of the domestic circle. Her life, her health, her moral and physical well-being, are not for herself alone, but for others, even for generations yet unborn.

If she be vigorous and healthy, the presumption is in favor of her children being so likewise. They are not only bone of her bone and flesh of her flesh, but, to a very great

extent, their whole character is modeled and made by hers. It is said that great men are always the sons of superior women, and as a rule the saying is true. Even the unborn child takes most of its attributes from her. The greatest care and watchfulness are, therefore, necessary during her whole child-bearing term. Then the newly-born child is intrusted to her sacred keeping, and she ought to be fully equal to the charge. If she were always so, the multitude of "infant-foods" so bountifully offered to the public, because of the incapacity of so many mothers, might all be turned over to the poor, unfortunate waifs in the infant asylums. The mother is to be pitied who cannot nurse her child, and to be blamed who will not. God and Nature make her, in the married state, rejoice in her maternity, "*matrem filiorum lætantem;*" art and fashion have no right to change her.

While a woman is in full maturity, and in the most attractive time of her life, the formed woman, and no longer girl or child, and not yet having passed the meridian of life, or beginning to feel that age is laying its impress upon her, though never so lightly, a beneficent Providence fits her eminently for great duties. It is said that man proposes and God disposes. Yet sometimes this seems to be reversed. God would fit her for her work, and man, or herself it may be, too often frustrates the great design. There is too great a departure from natural laws. On the one hand, the votary of pleasure or fashion sacrifices herself, and her children or her hopes of children. On the other hand, overwork, as stated in the "Song of the Shirt," leaves no time, nor thought, nor capacity, for the pleasing duties of maternal life. Society has its slaves as civilization has its slaves. In the extremes, the woman's part is frustrated, and thence often, even when there are many reasons for the preservation, occurs the extinction of families.

It is a happy mean in which the young matron responds to the bounteous gifts bestowed upon her, and offers to

society contributions in her healthy children, healthy by inheritance and culture, and healthy in morals from her instruction and example.

It may be withal that the young woman, whether maid, wife, or widow, may be the bread-winner, and she should be prepared from early life for a certain degree of independence. There are now many thousands of our fair countrywomen who have to deplore, not the want of education, as ordinarily understood, but the want of the kind of education that would have fitted them for earning subsistence. This usually requires physical as much as intellectual ability. If qualified, mentally, for teaching, for example, even this resource fails them if not sustained by good or even robust health. The same may be said of living by the pen or by any intellectual pursuit. Such occupations require good health, but do not confer it. The "valiant woman" must needs carry this element of success with her. More pains have been taken, unfortunately, in the past to deprive our educated women of it than to secure it to them. The future, let us trust, when wisdom and knowledge may be in closer alliance, will treat them more generously and more justly. Some preparation should be usually made for appropriate industrial pursuits. Some of the sex claim to be eminently strong-minded, but, above the peasant-class, we do not hear that any are supposed to be strong-bodied. While among the gentler sex our own would wish to see no "mannish woman," we would have diffused among them an improved *physique* for their individual good, as well as for the good of all who derive from them.

CHAPTER IV.

THE MAN.—THE WOMAN.

Section 1.—The Man.

"Every man is a fool or a physician at forty."

The man who reaches forty safely usually understands pretty well his own requirements, and about this time he may be nearly independent of physic and physicians. He is equally removed from the perturbations of growth and development, and the worn-down and degenerative condition of age. He is pretty well established in business, and he has a fair idea of what his relations may be with his fellow-men. Altogether he is just in his prime, in mental, physical, and moral force. Before the days of steamships, the captain of a vessel bound for the East Indies used to strike for the "trade-winds," where he could run for a considerable portion of his voyage upon an even keel before the friendly breeze, "without stirring tack or sheet," as Jack used to say. In the voyage of life our well-preserved man of forty may move on so equably in health-matters that for ten years there may not be wear and tear enough to cause appreciable deterioration. That this may be so we must assume that he is "temperate in all things." He must be no glutton nor wine-bibber; no reprobate, sensualist, gambler. His passions, which always exist, and are always active—for in life he will never be unimpassioned like the marble effigy on the monument—are not to be extinguished, but they are to be kept in subjection. As true gentleman, which he may be consistently with any honest

occupation, he ought to cultivate all gentle habits, and to promote peace and good-will throughout his surroundings. The consciousness of doing good to others tranquilizes a man's mind, and conduces to his own health and contentment; the consciousness of doing wrong and injury to others, no matter what the apparent gain to the individual, will surely bring a recoil to his own detriment.

He ought to be a good working man, and make an honest effort to improve his fortunes. A reasonable success makes life comparatively cheerful. "The hand of the diligent maketh rich," and "health, peace, and competence," are well associated. But competence does not signify superfluous riches. These add to men's cares and detract from their contentment. Diligence should be relieved with recreation. A British statesman once asserted that no man ever failed who worked seven days in the week. He may not fail, indeed, in getting some special object, it may be wealth, but in every other sense he will fail, and fall, prematurely. The seventh day's rest, decreed by supernal wisdom, is an absolute necessity for human welfare. It has been said, with force and truth, that when the "conscientious man husbands one day of his existence every week—who, instead of allowing Sunday to be trampled and torn in the hurry and scramble of life, treasures it up—the Lord of Sunday keeps it for him, and in length of days the hale of age gives it back with usury. The savings-bank of human existence is the weekly Sunday." The philosophers who tried to rob humanity of this beneficent day of rest and praise were simply madmen.

It was the prayer of the wise man that he should neither be tried with poverty nor riches. This implied equal freedom from crushing adversity or unbounded prosperity. All experience shows how sorely these extremes touch our race. But so surely as we have to bear varying degrees of temperature—from cold that may benumb us to a fatal sleep, to heat that cuts off existence by *coup de soleil*—just so

surely are we liable, at all ages, to the vicissitudes of fortune, and just as dangerous are they to human welfare. Sudden and vast changes of condition, like sudden changes of temperature, are most trying. What man has ever become suddenly rich, which so many desire, without being the worse for it? If there be one, he is a rare exception. The fall from riches to poverty, while the man is in his vigor, is much the safer of these variations. The rational man should keep from such trials as far as he may. Ups and downs, adversity, vicissitudes, are necessary to the formation of a strong and sterling character, and THE MAN should bear them with fortitude, but he should use all prudent measures to keep from extremes; and, as the rule, his well-directed efforts will insure his safety.

Profit and loss are very commonly, in every sense, *vis-à-vis*. One always wishes gain, but, as Dr. Richardson says, truly, those "who live for gain alone are among the acutest physical sufferers of the world. Every penny earned by excess of hard strain for it is grasped at a cost of vital power that never comes back. Disorganized heart, disorganized brain, are the physical evils with which the prize, when it comes, is won."

Our rational man, from forty to sixty, should be a good worker, mentally and physically, but not a slave to gain. He is entitled to rest, recreation, amusement, and these he ought to enjoy, with wife, children, and friends.

SECTION 2.—THE WOMAN.

"She looketh well to the ways of her household, and eateth not the bread of idleness. Her children arise up, and call her blessed; her husband also, and he praiseth her."

The counterpart to the MAN must be the WOMAN, if we may use a plain word which still holds its place in Holy Writ, and in the marriage contract. The woman of forty is not very different from the woman of thirty in physical condition. She now, if ever, represents the *better half* of

our race, for she is in the full bloom of maturity, in all that goes to make up the loveliness of a fine woman. At twenty she was but a grown-up child, with hopes and aspirations for herself alone ; at forty she is, or may be, the matronly guardian of children, in all of whose hopes, fears, anticipations, and prospects, she is but little less interested, and usually more wisely interested, than they are themselves. In the wife of forty, character is fully developed and revealed. If equal to her condition, young men and maidens look up to her as a model ; the young man would like to have just such a wife. With the best discretion, matrimony is something of a lottery, and it takes time and circumstances to show what kind of a prize has been drawn, if any. When a youth is thrust upon the world, its rough handling makes him foreshow pretty early what will be the development ; but a young maiden, in her seclusion, rarely can show, or has any occasion to show, what manner of woman she may become.

Our model woman ought to be a fairly early riser, to start her household in well-adjusted order for the day. It was one of Dr. Franklin's wise sayings that, when work got behindhand in the morning, it could not be overtaken in the evening. Order tends to economize health as well as time. There is no domestic discipline without it, there is no satisfaction in a house where it does not prevail. Early rising requires that evenings and nights shall be spent rationally, not in revelry or dissipation. The evening may be very properly given to society ; but, when night after night is sacrificed to society-life, the best interests of the family are sacrificed at the same time.

The orderly woman has time for mental culture ; if she takes time for it without order in her household, she will find herself one of a very unhappy class of women. By beginning early in the morning she may so dispose of her time as to give certain hours to domestic duties, certain hours to society, certain hours to culture and recreation.

The duties of a true Christian matron may be interblended with all others. Religion, moral, physical, and mental culture, may be made to run so evenly together that, so far from clashing or interfering, each promotes and adorns the other.

There are many reasons why prudent habits should prevail at this time of life. As previously said, the female organization, always more impressible than that of the male, requires not only a general but a special hygiene. Between ten and twenty years of age, evolution requires particular care ; and womanhood, in its development ranging about from fifteen to forty-five years, with more or less latitude, is subject to physiological laws of the greatest importance, affecting the interests of the individual and of the race. Another important term is now approaching. Between forty and fifty years occurs a very critical term—*temps critique*, or *âge de retour*, as the French call it. These various changes are physiological ; that is, they occur properly in the natural order, but they are easily deranged, so as to become pathological, and natural order is thus supplanted by unnatural disorder, which is in these days apparently more the rule than the exception.

There is no reason in Nature why the *âge de retour*, or the "change of life," should be attended with danger, or with derangement of health, but it usually is so. As Dr. Tilt says touching this matter, there ought to be a knowledge of the reality of the dangers ; and, furthermore, *a conviction that these dangers can, for the most part, be avoided by a judicious line of conduct.*

In speaking of dangers, it is by no means asserted that mortality is greatly increased at this time. And, indeed, while this term has its dangers, it has its compensations also in removing many sources of danger. The revolution effected is often a very salutary one. Nevertheless the term has its attendant dangers, which rather impair health than immediately threaten life. Certain periodical sympa-

thetic or reflex disturbances may become greatly aggravated. The nervous centres may be much disordered. Heaviness in the head, dimness of the eyes, a bewildered feeling, and sometimes the semblance of intoxication (*pseudo-narcotism*), are observed by the sufferer or her friends. An increase of anomalous or fugitive pains, spinal, hypogastric, or in the lower limbs, is very common.

Ganglionic Symptoms.—"Am I wrong," says Dr. Tilt, "in referring the following symptoms more particularly to that nervous system, the filaments of which, like a web, envelop the smallest arterial vessel in their inextricable mazes? Sensations of faintness, exhaustion, and sinking, often referred to the epigastric region, heats and flushes, perspirations, drenching sweats," the last of which, at least, have a salutary influence by giving a sort of vicarious relief.

Pelvic plethora is very common, which may find relief in hæmorrhoidal discharges, in diarrhœa, or other flux, which gives the whole organism time to recover its equilibrium. The disturbances likely to take place at this time are very numerous, but they are for the most part "more annoying than dangerous." Formidable organic diseases may indeed supervene, but they are to be considered for the most part *post*, not *propter*, a change which all women must undergo at a certain time of life. Coincident and consecutive diseases are often attributed to this change without sufficient reason.

The prudent and well-ordered life previously to this great change is least disturbed by it. But few women, in the higher classes at least, approach it who have not suffered from one or many deteriorating agencies, whether avoidable or unavoidable. Their childhood, youth, early womanhood, and maturity, have, in many instances, all been mismanaged. Some have had too much schooling (not too much learning), some not enough; some have had too much work or privation; some too much ease or luxury; some too much mental, some too much physical strain;

some not use enough of their faculties to give them development; some have been slaves to society, some to domestic drudgery; some have only exercised in easy carriages to *rest* after their fatigue upon the softest beds or couches; others have trudged upon their weary limbs, standing, walking, or running the treadmill known as the sewing-machine, until the limbs not only give way, but send reflex disorder or disease to vital centres. Some are run down with the physical cares given to children; and some, alas! exempt from this source of exhaustion, by the heart-aches caused by the errors, or it may be the crimes, of their unhappy offspring promising to bring down their gray hairs in sorrow and humiliation to the grave. She is a rare woman of five-and-forty who has not her own sorrow, it may even be unto death, or it may be only chastening.

The past she cannot remedy, but the present she may usually to some extent control. She may so regulate her life that there shall be no new perturbation. Prudence, fortitude, justice, and temperance, will ever be trusty guides.

Emerging safely from the change she starts upon a somewhat new basis. *Homo sum;* many troubles and trials have ceased; she walks now for a time by her lord, not so strong as he, perhaps, but at least as free from infirmities.

CHAPTER V.

THE DECLINING OR OLD MAN.

"Mens enim, et ratio, et consilium, in senibus est."

Cato the Elder makes the superior wisdom of age more than compensate for the vigor and pleasures of youth. Men ought not to be such fools, he says, as to complain of that part of life which they have always desired so earnestly to reach. He would have something of the gravity of age in the young man, and something of the vivacity of youth in the old man, so that his mind may not grow infirm as the body grows old: "*Quod qui sequitur, corpore senex esse poterit, animo nunquam erit.*"

The man of sixty is beginning to grow old bodily, but his intellectual faculties, if they have been fairly treated, are as sound comparatively as his physical forces were at forty. The avenues to his intelligence are, it is true, becoming somewhat obstructed. He will not be so quick to learn as in times past, but the highest faculties, *mens*, *ratio*, *consilium*, are but just fully mature. He ought to be a wiser and a better man than ever; introspective, and retrospective. It is to be hoped that in the retrospect he will not feel like Lord Chesterfield, who said that his life seemed to have passed in frivolous hurry and bustle, like a wild dream caused by opium, from another dose of which he would turn away with disgust.

At threescore and ten, life comes to its natural close, says the Psalmist. Pythagoras allows fourscore years, and

Dr. Richardson generously concedes ten more years to a strong frame well preserved. During all these years "the steady attraction of the earth is ever telling upon the living body." The vital force resists, but at length "there comes a time when this resistance begins to fail, so that the earth, which never for a moment loses her grasp, commences and continues to prevail, and after a struggle, extended from twenty to thirty years (from sixty to ninety), conquers, bringing the exhausted organism, which has daily approached nearer and nearer to her dead self, into her dead bosom."

There are men wise in their own conceit, who tell us that this is the final end of man, or, in other words, that human life has no destiny but death, no object but an eternal sleep! Death's head and cross-bones do not make a pleasant emblem to contemplate, yet this is all they would offer us!

Age has its proper system of hygiene. The declining man is willing to look on feats of strength and agility as a spectator, rather than take part as an actor. Yet he will by no means give himself up to physical inertia. He may walk, ride, drive, pursue his usual occupations, *cum modo*, indeed, with discretion; but he must not *retire*, as it is called, from useful pursuits. He may, if he please, sell his ship and buy a farm, but then he must look to the kine and the cabbages. He may plan and improve; pull down an old tenant-house, and put up a new one on improved sanitary principles, so that from cellar to roof-tree there shall be no lurking-place for any germ of disease.

Personally and individually he is less liable to acute disease than when younger. He is indeed getting to be somewhat calcareous; his bones and joints are getting an undue proportion of earthy matter, with a proportionate loss or induration of animal matter; he is getting less flexible, and as he gets further advanced, a misstep on

the stairs or a fall on the ice may cause a broken bone, while in middle life it would have produced only a trifling bruise. He generally avoids such accidents by becoming, unconsciously it may be, more careful in all his movements. He does not attempt to go down the stairs at a bound like his grandson, nor to jump on every ice-surface he encounters for a slide. He shakes his head with a grave smile at the pert boy who invites him to attempt such gymnastics.

Earth reaches the bones of his chest as well as the bones of his limbs. His ribs become indurated, and their once flexible cartilages become so firm as to interfere with the freedom of respiration. Herein he finds another reason for cautious and leisurely movements. He breathes well enough when not hurried or excited, but with distress if he attempts haste. He may not run half a square to overtake a street car, he may not take any John Gilpin ride, he may not climb a volcanic mountain to see the crater, nor to a lofty belfry for a view of the city.

Earth, not stopping at the outworks, encroaches upon the vitals too. It may take hold of the valves of the heart, or convert the once beautifully flexible arteries, in parts, into tubes almost as brittle as old-fashioned pipe-stems, which will snap for trivial causes, and let the blood-current escape, it may be, into the parenchyma of some vital organ.

The common mother is indeed taking gradual possession of that part of the man which belongs to her ; she may be, and often is, encroaching little by little for a score or more of years. She has no need to make haste ; he will surely be hers in due time, which she will not anticipate, though he often does, by late or early errors, whether his own or those of his forefathers.

Most of the tissues undergo degradation—that is, pass from a higher to a lower degree of vitality. The heart becomes weak or fatty, and carries on its functions feebly.

An inexperienced examiner might readily mistake a sensation of resistance from indurated arteries for an indication of a strong pulse or a vigorous circulation, while the very reverse obtains in fact, and the circulation is failing.

The brain gradually becomes degenerate also. It undergoes waste and change, and the cerebral cells lose the definition proper to them when in full vigor. That brain "which some consider the soul's frail dwelling-place" becomes like a worn-out instrument of music. The performer may preside over the harp with the inspiration and skill of former years, but its worn or broken strings will no longer "the soul of music shed." It will give for a while uncertain notes, more and more discordant and inharmonious, before becoming altogether mute.

As the brain, or more generally the nervous system, presides over all living organs and their functions, it follows that its impairment implies universal deterioration. The digestive organs, all engaged in secretion and excretion—in other words, all upon which the functional activity of life depends—work sluggishly or irregularly. "He is not the man he used to be," is habitually said of the elderly or declining man by the observers about him, before the infirmities of age have withdrawn him from active pursuits. He may be silently making to himself the same acknowledgment. Though less subject to acute disease than in earlier life, infirmities multiply upon him. He is probably rheumatic, gouty, or subject to fluxes, as to bronchorrhœa, or *catarrhus senilis.* He is sensitive to cold, and should not be exposed to its depressing influence, as he can no longer resist it by active exertion. When a young man is threatened with internal congestion from passive exposure to cold, he may warm and save himself by a little vigorous exercise, but his grandfather has not this resource ; his low vitality must be saved by artificial warmth.

The man is not what he used to be ; involution has taken the place of evolution, and our veteran is assuredly "homeward bound." But even in his decline there is a kind of conservatism. Infirmity is something of a safeguard. Indeed, all through life, how often do we see people of infirm or delicate stamina outliving the most robust, simply because infirmity often gives notes of warning, and enforces, it may be, lessons of self-restraint ! And thus, as Hufeland says, a man in advanced life, with his powers lessened, would finish his career sooner, were it not for the adaptations of age.

"This position, which appears to be somewhat paradoxical, is confirmed by the following explanation : Man, during the period of old age, has a much smaller provision of vital power, and a much less capacity for restoration. If he lived with the same activity and vigor as before, this provision would be much sooner exhausted, and death would soon be the consequence. Now the character of age lessens the natural irritability and sensibility of the body, by which the effects of internal as well as external irritation, and consequently the exertion and wasting of the powers, are also lessened ; and on this account, as consumption is less, he can with such a stock of powers hold out much longer. The decrease of the intensity of the vital processes, as age increases, prolongs, therefore, vital duration."

The man learns to accommodate himself to his condition. Having lost his teeth, entirely or partially, he takes to food which does not require great mastication. The use of artificial teeth, of late years so universal, is, by-the-way, greatly promotive of health and longevity. We have seen chronic dyspepsia and its attendant evils quite remedied by the removal of defective old teeth and the insertion of good sets of artificial teeth.

But, in declining age, the gastric powers are also defective ; and, although good teeth exert the most beneficial

influence, still the stomach requires careful management. Treating of *stomachic and labyrinthine vertigo*, Dr. Woakes says, in a late number of the *American Journal of Medical Sciences:* "It would seem that Nature had in the labyrinth erected a signal-box in which a note of warning might be sounded by the much-abused though tolerant viscus, the stomach, whenever the ill-treatment it is subjected to threatens to compromise more vital parts of the organism. It would seem to teach us, what the acquired wisdom of advancing years so often fails to do, that the senile stomach is not the fit receptacle of unmasticated meat; that it resents the slight shown it in this, and, of course, in many other ways—first of all by warning attacks of giddiness, which, if not heeded, will shortly culminate in a fall. It was by such a catastrophe that the Duke of Wellington lost his life—the unscathed hero of a hundred fights failed to prove himself master of the situation when the forces arrayed against him were a vigorous appetite and an acutely-sympathetic labyrinthine circulation."

The defective innervation of the stomach cannot, of course, be cured by improved mastication, but its failing capabilities will be less severely tried, and thence conservatism of vital power to an extent readily appreciable. We heard but the other day of an elderly gentleman, an octogenarian, suffering from vertiginous affections—*a stomacho læso*, probably—who was greatly relieved by the free use of capsicum. The spice acted as a spur to the sluggish gastric nerves.

A man, of fair inheritance, who has done justice to himself, ought not to be *very old* under eighty years of age. When Adam, now almost fourscore, offered to follow Orlando, he strongly urged his fitness:

> "Though I look old, yet I am strong and lusty;
> For in my youth I never did apply

Hot and rebellious liquors in my blood;
Nor did with unbashful forehead woo
The means of weakness and debility;
Therefore my age is as a lusty winter,
Frosty but kindly: let me go with you,
I'll do the service of a younger man,
In all your business and necessities."

The good old man herein gave a text for younger men who would not grow old before their time, as so many do. Hufeland, speaking of young men prematurely old, says he dissected one scarcely forty years of age, gray-haired, and with the cartilages of the ribs totally ossified, as in extreme old age.

This writer gives some rules for getting through life speedily, or of becoming old by a hastening or high-pressure process. Thus the aspirant must attain to maturity as fast as possible, and waste vital power in sensual pleasures, as a spendthrift does riches, without stint. He must undergo excessive fatigue, no matter if he work all day and dance all night. He must drink abundance of wine and strong liquors. He must encourage the depressing passions—care, fear, sorrow. He must use not only cold bathing, but take prolonged cold baths.

A great deal may be accomplished, undoubtedly, by such agencies, but the writer just quoted prudently suggests that they are offered as warnings of what should be avoided. Many act, indeed, as if they were right rules, but they are only such for the ways of destruction.

As the real old man approaches the last scene of all, the breaking-up is general, not partial. He loses superfluous fat, but morbid or misplaced fat, fatty degeneration, no matter how wasted his muscles, is often extensive. It is subject to inspection in the eye, where it forms a whitish border known as the *arcus* or *circulus senilis*. This is commonly taken by physicians as an indication of what is going on within. It often tends to explain the enfeebled action of

the heart. While some parts are becoming unduly softened, in vital organs it may be, as in the heart or the brain, others become abnormally dry or hardened. Dr. Richardson says that the gradual transformation of the vital organs of the body, from the advance of age, is due to a change in the colloidal matter which forms the organic basis of all the living tissues. In its active state this substance is combined with water, by which its activity and flexibility are maintained in whatever organ it is present—brain, nerve, muscle, eyeball, cartilage, membrane. In course of time this combination with water is lessened, whereupon the vital tissues become thickened or pectous. By attraction of cohesion the organic particles are welded more closely together, until at length the nervous matter loses its mobility, and the physical inertia is complete.

It may readily happen that, in one and the same organ, morbid indurations and softenings may be found side by side, or the one condition may pass to the other.

Some indurations are capable of giving a great deal of distress by mechanical influence. The prostate gland at the neck of the bladder causes one of the most distressing infirmities of age, by induration so that it retards or hinders the flow of a depurative excretion, the retention of which is at once mechanically dangerous and chemically poisonous.

It will be seen that the infirmities of age are constantly bordering upon disease, when medical or surgical aid must be had. The hygeist only proposes aids to make the infirmities comparatively endurable, and to keep them, so far as may be, from passing that border-line which they are ever approaching.

It has been already said that the elderly or declining man is not to yield to physical or mental inertia. The *dolce far niente* is admissible at all ages as a respite from useful occupation, but to give it a primary place in one's career is a woful mistake.

Allowing eight hours for sleep, there are sixteen more

to be consumed every day in the use of the faculties. They ought to be more or less apportioned according to the man's pursuits or condition in life. An old lawyer thus adjusted his time :

> "Six hours to law, to soothing slumbers seven,
> Ten to the world allot, and all to heaven."

Whatever the subdivisions may be, as much time may surely be given to work or useful occupation as to sleep. Regular hours ought to be observed for sleep and meals ; in fact, the elderly, more than a younger man, ought to move as it were in grooves. There is a saying that one hour's sleep before midnight is worth more than two after ; this may apply at all ages, but especially at the time now under consideration. With the young, exhaustion may be followed by recuperation ; with the old, exhaustion should be carefully avoided, as the recuperative powers are pretty well worn out.

A man of studious and thoughtful habits may well keep them up in his declining years. Pythagoras says virtue consists in harmony between the passions and reason. During the greater part of life these are in active antagonism, and it is difficult to bring them into harmony ; it should not be so as age advances. If this be not with the individual the age of reason, then he has none. Age, up to a certain term, keeps the reasoning faculties in their integrity while the passions are declining. It thus gives the elderly man some advantages that he may appreciate and use. He probably has a pretty good fund of aquirement, which he may add to or renew.

"There is a tendency," says Prof. Bain, "in acquisitions to decay, unless renewed. Hence a time must come in the progress of acquisition when the whole available force of growth is needed in order to conserve what we have already got ; when, in fact, we are losing at one end as much as we are gaining at the other.

"It is further to be remarked that much of our improvement in later life is the *substitution* of a better class of judgments for our first immature notions, these last being gradually dropped."—("Mind and Body.")

There are a great many instances of new acquisitions in advanced life, but no doubt it often happens as this writer says: "The memory at last, if it does not refuse new burdens, gives them place by letting go much that has been previously learned. Moreover, a wide scholarship turns into a knowledge of the places where knowledge is."

That substitution of the better class of judgments is the maturing of the wisdom of age. This is indeed the man's age of reason, though far different from that of the insane philosophers of the last century. "Tell us what we will have in the coming days," said Condorcet to Cazotte; "a philosopher is not sorry to encounter a prophet." "For you, M. Condorcet," was the reply, "you will die stretched on the floor of a dungeon; you will die of the poison that you will be obliged to take in order to avoid the block—of the poison which the happiness of that time will oblige you to carry about with you."

Man has an intellectual and moral, as woman has a physical, *âge de retour*. It is the time when reason, after a long conflict, may quite predominate over the passions, or at least over those which are most turbulent. It is a time when thought and action should be above passion or prejudice, and happily it may merge in that space which it has been said should intervene between the active business of life and its close.

Our elderly man must "grow old gracefully," by continued culture of the mental and moral faculties, while he keeps up so much of physical exertion as may be necessary for the preservation, not for the increase, of the physical powers. If a clever man, he may hold his own morally and intellectually longer than physically; but the reverse may

happen, so that the physical organism preserves not its integrity, indeed, but capability of action, when the higher faculties are comparatively inert or exhausted. There are always primary differences in men: from inheritance, temperament, mental and physical constitution, and other conditions or causes, cognizable or non-cognizable, which influence a man's whole existence from the cradle to the grave. Education and habits modify the man, but they do not make him. It is a philosophic dictum that we are what we are by our organization in the first instance, and by instruction in the second. The first element is of course the more invariable of the two.

The elderly man requires the comforts of a well-ordered home. He wants regular meals, without fasting or feasting:

> "Let both extremes be banished from his walls,
> Carthusian fasts and fulsome bacchanals."

He wants simple food, well prepared, nutritious, and not heavy. A glass of wine, a *little wine*, as the apostle says, may be well for his stomach's sake. Wine is said to be the milk of old age, and often it is beneficial, but no rule can be made in regard to its use which is equally applicable to all persons. It may be asserted that in mere debility a little pure wine at dinner is beneficial, but where there is a proneness to cerebral congestions or apoplexy, which is sufficiently common in age, wine can only be exceptionally admissible. The remedial use of wine or spirit is not now discussed; the passing reference made to it here is as a form of food. As such, those who suggest its indiscriminate use, and those who would reject or forbid its use altogether, are, in the opinion of the writer, equally wrong in their extreme positions.

Mr. —— should have a sleeping apartment which is not too close, nor yet subject to irregular draughts. The temperature of the bedchamber should be tolerably uniform;

many hygeists suggest about 60° Fahr., but regard must be had to the sensations of the individual most concerned. One may sleep comfortably in a room at about that temperature, but for most persons that would be too low for passive exposure, as for reading or writing, though satisfactory enough for moderate physical exertion. When Mr. —— rises in the morning, and would take his sponge-bath, the temperature of his room would not be at all too high at 70° Fahr.

Passive exposure to cold at this age is very hazardous; and it is still more hazardous to rush suddenly from a very cold to a very warm or heated atmosphere. The changes should be gradual. Otherwise there is great danger of deep visceral congestions, especially of the lungs. Inflammation and fever readily ensue, with danger proportionate to the enfeebled condition of the subject. Vernal vicissitudes, especially when sudden warmth succeeds to severe cold, or *vice versa*, are very fatal to people advanced in years, and especially to those who rashly presume upon past powers of endurance.

When regular habits are spoken of, it must be understood that they apply to throwing off effete material as well as to taking in new supplies. All the gastro-intestinal glands, whether secretory or absorbent, waste, and fail in function with the progress of age. Thus Peyer's patches become almost obliterated after middle life. There is loss of muscular tone with attendant defective innervation. Torpor of the bowels, atony, especially of the colon, or of the entire large intestine, are rather the rule than the exception. Loss of propulsive force becomes more and more marked, and, with blunted sensibilities, our subject, we had nearly said patient, is apt to get careless and indifferent as to the natural mode of relief. This should not be so. Matters retained unduly undergo chemical changes and are thereby capable of spreading infection throughout the whole system, in addition to the local disorders which they pro-

duce. A regular effort should be made daily for relief, soon after a meal being the best time, upon the principle, as Trousseau expresses it, that one nail may be made to force out another. Kneading, and the judicious use of water, will help the cause; these agencies failing, recourse must be had to medicine, with medical advice; for it is by no means a matter of indifference what kind of purgatives shall be used, even when this class of remedies is clearly indicated.

The clothing of elderly people is a matter of great importance. They want non-conducting material about the person, so as to keep it measurably protected from vicissitudes. "Purple and *fine linen*" may be dispensed with, especially the latter. Cotton and *fine woolen* make the best garments. Woolen undershirts should be worn at all seasons, varied only in weight, being light in summer and heavy in winter. Even in the tropics, health is generally best preserved by woolen clothes. Silk may be worn by those who give it preference, though really not so protective as wool.

Linen is very unsuitable for underwear, especially where there is any tendency to rheumatism. Rheumatism predisposes to or causes diseases of the heart, and heart-clots. Independently of this particular malady, heart-clots are liable to form with advancing age, and directly impair or arrest the heart's action, or send detached concretions to remote or adjacent parts, as to the brain or lungs. These concretions, or emboli, are always dangerous and often fatal. Whatever chills the præcordium is liable to aggravate this danger; whatever gives it protection tends to diminish it. Non-conducting material, then, such as flannel, fur, or silk, is the proper covering for that sensitive region; and linen, as a good conductor, is conversely inappropriate.

In other regards, the dress may be adapted to the comfort and convenience of the wearer. There will be no com-

fort with binding or constriction, as about the throat or chest, or in tight-fitting shoes. It is an old saying that one must keep the feet warm and the head cool, but the latter portion is something of a play upon words. The man whom age has robbed of the natural covering of his head often suffers more than discomfort from the loss, and may require artificial protection. The bald old gentleman riding around on a rough day, in an open carriage, with his head uncovered, in honor of the *hoi polloi* by the wayside just before the election, is not in the state of felicity that might be inferred from his smiles. Neuralgia, or some yet more insidious enemy, is probably taking the measure of that head, on that day, before taking possession on the day following.

A remarkable life terminated just as the writer was concluding his essay *de senectute*, and the whole career was an illustrative one. Mr. William Cullen Bryant died at the age of eighty-four, as the result of an accident. A few years ago he wrote, by request, a letter to a friend describing his mode of living, saying that he had reached a pretty advanced period without the usual infirmities of old age, and with strength, activity, and bodily faculties generally, in good preservation.

Mr. Bryant, one of the most intellectual men of the age, poet, editor, philosopher, rose always with or before the sun, and gave an hour to physical exercise of a very moderate kind. He used dumb-bells "of the lightest," or swung a chair around his head to expand his chest. He then took a morning bath. In the country he would exercise by going out to prune his trees, or engage in some such useful work on his farm. His breakfast was of hominy and milk, with a little fruit, or something equally simple. After breakfast, a short time was devoted to study in his library, and then a walk of three miles to the office of the *Evening Post*. After three hours at the office, he would walk home,

no matter what the state of the weather. He would take an early dinner, eating vegetables freely, and meat at that meal only. He would eat fruit at all times. In the evening, no tea, but bread, butter, and fruit. After this repast, no severe mental labor, as tasking the faculties then excites the nervous system and prevents sound sleep. He went to bed about ten o'clock. "My drink," he says, "is water, yet I sometimes, though rarely, take a glass of wine. I am a natural temperance man, finding myself rather confused than exhilarated by wine. I never meddle with tobacco, except to quarrel with its use."

Here is an instance of history teaching philosophy by example. Mental and physical occupation were duly interblended, so that there was no sacrifice of one class of faculties to the other. He had no use for wine. The "crystal element," approved by Dr. Armstrong in the art of preserving health, sufficed him. The medical poet justly commends that refreshing beverage as furnished by naiads, not bar-maids, to good old men of rural ages :

> "Happy in temperate peace their equal days,
> Felt not the alternate fits of feverish mirth
> And sick dejection; still serene and pleased,
> Full long they lived; their only fate
> Was ripe old age, and rather sleep than death."

The late Prof. L. P. Yandell, in his last contribution to medical literature, "On Old Age: Its Diseases and Hygiene," makes the final assertion that, while old men should have congenial occupations, avoiding violent bodily exertion, gusts of passion, "and painful thinking," yet "the thought," he says, "with which I would close this essay is, that the danger which most imperils the comfort of old age is not overwork, but the want of enlivening occupation."

Every practising physician will indorse this statement, and will, for the most part, prove his belief in occupation, as this venerable old gentleman did, by ministering to his fellow-men until summoned himself to pass from time to eternity.

PART II.

HYGIENICS IN SOME DETAIL.

CHAPTER I.

TEMPERAMENTS AND IDIOSYNCRASIES.—INHERITANCE.—HABIT.—CONSTITUTION.

In the foregoing pages the principles of hygiene have been constantly kept in view, and urged through the various terms of life therein considered.

Many important matters will now be considered somewhat in detail, though briefly. It is as impossible to make rules suitable to all cases, or to every individual case, as it was, without great violence, to make every man meet the exact measure of the bed of Procrustes. In health every one requires some modifications of the general laws of hygiene for himself; just as in disease the physician finds it necessary to modify his treatment in every case, in accordance with the condition of the individual at that particular time, and not according to the name of the disease, as the unlearned are apt to suppose.

Any intelligent man conversant with the principles of hygiene can readily make adaptations suitable to his individual necessities. Thus, for example, instead of taking a bath at a given temperature supposed to be just right, he will find the advantage of varying up or down the scale, it may be a matter of from 10° to 20° Fahr.

The great differences in individuals, many of which are perfectly obvious, must always be taken into account. General physical structure, height, weight, and proportions, require attention. A developed man, twenty-five years of age, and six feet in height, should weigh about one hundred and sixty pounds. A measurement of the chest, over the nipples, should give a circumference at least equal to one-half of the height of the individual. A larger measurement indicates a full chest, a less measurement a defective one.

Difference of race has to be considered. The white race, or the European, according to Agassiz, is superior to all others, morally, mentally, and physically. It has most endurance, and greatest powers of adaptation.

Section 1.—Temperaments and Idiosyncrasies.

We do not consider temperaments in these days to rest upon a well-founded scientific basis, but still there are certain appearances, distinctive of individuals or families, which mark what are conventionally and conveniently called their temperaments. A man of dark complexion and hair, more or less grave or stern in manner, is said to be of the bilious or choleric temperament. One of florid complexion, with a quick circulation and a tendency to hæmorrhages, is said to be of the sanguine temperament. The lymphatic or phlegmatic temperament is shown by sluggishness of mental and physical functions; and the nervous temperament by nervous excitability, with tendency to nervous disorders or diseases.

"The Greek physiologists," says Dr. Millingen, "were the first to classify these peculiarities, or *temperamenta*—the *naturæ* of Hippocrates, the *mixturæ* of Galen. They considered organized bodies as an assemblage of elements endowed with different properties, but combined in such manner that their unions should constitute a whole, in which none should predominate in a healthy condition; but, on the contrary, they were to modify and *temper* each other,

their simultaneous action being directed and controlled by the spirit of life, *spiritus*. It was the due combination of these elements that constituted a perfect temperament; their aberrancy produced disease of body or mind."—("Curiosities of Medical Experience.")

There are certain modifications of character and of condition which we commonly attribute to temperament, but "the elements are so mixed up" that dividing lines are scarcely practicable. The term will doubtless hold its own, no matter how vague the meaning.

Idiosyncrasy is some peculiarity of condition attaching to an individual, wherein he differs from the ordinary standard. "What is one man's meat is another man's poison." It often happens that some article of food, or drink, or medicine, affects an individual quite differently from the manner in which it affects the generality of men. Some persons are insusceptible to certain contagia; others find no immunity from one or even more attacks of such disease, as, e. g., small-pox, which usually can only attack once in a lifetime. A patient should always make known his idiosyncrasies to his attending physician.

Section 2.—Inheritance.

Hereditary tendency demands attention. As parents transmit form and feature, so do they likewise transmit strength or infirmity. If one or other parent be scrofulous or consumptive, the disease or tendency thereto will rarely fail to be transmitted to some of the offspring. People are not infrequently short-lived because of the sins of their fathers, on account of which, as Hufeland says, a shorter *stamen vitæ* is accorded to them. A man who would not be properly careful on his own account should be so in mercy and justice to his offspring.

The intermarriage of disease has noteworthy influences. If two consumptive, cancerous, or insane persons meet in wedlock, their children may be considered assuredly doomed.

Persons of the same stock, family, or blood, are apt to have similar tendencies in regard to diseases or infirmities, and for that reason, if for no other, near relatives should not intermarry.

Persons with transmissible diseases, present or impending, should not enter upon wedlock. Dr. Richardson recites the following illustration of the intermarriage of two formidable proclivities, which may serve as a significant warning: "A young man of marked cancerous proclivity married a woman whose parents had both died of pulmonary consumption. This married couple had a family of five children, all of whom grew up to adolescence, sustaining at their best but delicate and feeble existences. The first of these children died of a disease allied to cancer, called *lupus;* the second, of simple pulmonary consumption; the third, owing to tubercular deposit in the brain, succumbed from epileptiform convulsions; the fourth, with symptoms of tubercular brain-disease, sank from diabetes, the result of nervous injury; and the last, living longer than any of the rest, viz., to thirty-six years, died of cancer. The parents, in this instance, survived three of the children, but they both died comparatively early in life; the father from cancerous disease of the liver, the mother from heart-disease and bronchitis."—("Diseases of Modern Life.")

Section 3.—Habit.

Man becomes in time a creature of habit, if not a slave to it. This being so, the cultivation of good habits is extremely important. Regular and well-ordered habits of life certainly promote health and longevity.

Food and drink, and evacuations, labor and rest, exercise, the working and the sleeping hours, should all be systematized. It is not meant, however, that a man must move like a clock or other piece of machinery, but only that order should be his rule, admitting withal of some deviations for the vicissitudes of life. We knew a fine old gentleman

whose system induced him to lay out a programme for every day of the year, and this included change of clothing appropriate to the change of seasons. He had his day for assuming his winter garments, and his day for his summer clothes. The seasons might deviate from the regular order, but he would not, and the consequence was in the end that he died of system, some years before the allotted term.

The writer has had patients from a boarding-school at which the systematic principal caused the winter fires to be lighted at a fixed time every recurring autumn. As a consequence, the more sensitive pupils had to suffer more or less seriously from the depressing influence of cold as they sat at their studies when, perchance, cold days anticipated the cold season, as they usually do. It is evident that system requires discretion.

It is the habit of some men to give way to their passions or emotions, without exercising due self-control. Such habitual yielding, as to anger, hatred, or a spirit of revenge, may lead eventually to insanity or crime. Habitual yielding to the animal passions without due restraint is directly or remotely promotive of premature decay, or mental or physical imbecility, or both.

The habit of inordinate eating or drinking is incompatible with health.

Habitual overwork, or excessive intensity of life, tends to induce premature failure. Napoleon Bonaparte is said to have allowed habitually but four hours of the twenty-four to sleep ; for twenty hours, then, his mind and body were in extreme tension. Some years ago an able *critique* was written by a competent observer on the battle of Waterloo, and the whole gist of the argument went to show that Napoleon at that time, when but little over forty-five years of age, was waxing old, mentally and physically. He had already outlived the transcendent and unrivaled abilities which he had possessed but a few years before in the zenith of his power. This view is probably correct.

The habit of *idleness* leads to moral and physical injury. Mind and body are strengthened by salutary exercise, and become weakened by disuse. The muscles waste away. The writer once saw in consultation a delicate woman, the wife of a paralytic husband. She had an infirmity that induced some pain when she attempted to walk, and in time she ceased to make any effort, from supposed incapacity, until at length she seemed as much disabled as her husband. She became paraplegic, like her husband, by mere force of imitation ; her muscles became weak and wasted, and she persistently declared herself unable to stand or to walk. This inability was becoming real from habitual disuse of the limbs. About that time a charlatan was advertising remarkable cures ; the blind, the deaf, and the halt, were instantly cured by his magical touch, together with some cabalistic words used at the same time. This patient, being under no medical care, fell into his hands, and in a short time was walking about her house. From accounts given, he gave her what would have been considered from other hands nothing less than a terrible drubbing. The *passes* made upon her spine were such as to alarm not only the patient but the whole household. He then ordered her to walk, which she did, and continued to do, though the original malady, as treated by her regular physician, remained unchanged.

Neither mind nor body should be allowed to be frittered away in idleness. Eating, and drinking, and sleeping, are necessary to life, but they are not its objects. "The life of man," says Hufeland, "has a higher destination—action, business, enjoyment." We may here interpose that enjoyment is an important part of life if properly taken. The working-man is justly entitled to all that he can get of it, provided it be of a salutary kind, and in proper time and place. Happiness is a rightful aim, even in this transient career, and rational enjoyment goes to the sum of happiness and of physical and moral well-being. No man will find

happiness, content, enjoyment, in idleness, but this term does not apply to needful rest or recreation. A man is often said to be enjoying life who is merely wasting it. This, of course, is a great mistake. A man to enjoy life must have all of his time employed, though a fair portion of that time may be allotted to amusement, which, as affording mental or physical recreation, is not to be deemed idleness.

Section 4.—Constitution.

Every living individual has his own proper mould, with a degree of power or want of power, of harmony or want of harmony, in his various organs, which go to make up what is called, in the *ensemble*, his constitution. When a man is well endowed, so that there is a due and fair adjustment of all the various parts, particularly of those organs most important to health, as the digestive, circulatory, pulmonary, and nervous organs or apparatus, we say he has a good constitution. He is then, accidents aside, fitted for health and longevity. When, however, there is defect in the construction of certain important organs, when all are feeble, or poorly developed, or when there is an apparent want of vital power, we say the man has a delicate or bad constitution.

A good constitution implies a great deal in regard to the individual man. It means a good head, a well-developed chest, a strong stomach and digestive organs, and good muscular development, upon a well-constructed frame. Such a combination is very apt to carry what is called good nature or good temper along with it.

There are few people, in civilized life at least, who have this endowment in its plenitude. The culture of civilization, indeed, makes up to some extent by art for the debits with which Nature charges us. A very vigorous constitution has its privileges and immunities, but it is capable of misleading men also by giving them an excess of confidence in their own strength, so that they take risks beyond

the line of prudence. And thus "the battle is not always to the strong."

There is a mediocrity of range which embraces the majority of men. He is an exceptional man who has not some tendency to weakness of one or more organs. Individuals and families show these tendencies. In one man, or in one family, the narrow chest leads to the apprehension of pulmonary disease, or at least of pulmonary debility. In another, the formation about the head and neck may lead to the apprehension of apoplexy. Some individuals and families have a remarkable tendency to hæmorrhages. In almost all families some predispositions to infirmities or disease are recognized or acknowledged.

In some the tendency is so strong and so persistent that the constitution is essentially bad; in others it is so slight that the constitution may be considered good in spite of the known tendency.

It is much easier in life to impair a good constitution than to give vigor to a defective one; yet it often happens that a sound, conservative management saves individuals from apparently impending diseases or infirmities. Thus such maladies as consumption, scrofula, and even mental insanity, may be warded off by the salutary influence of *medicina conservativa*, or sanitary science.

CHAPTER II.

THE AIR WE BREATHE. — SEWERS AND CESSPOOLS. — OZONE. — MALARIA. — ANIMAL EMANATIONS. — DEVITALIZED HOUSE-AIR.

Section 1.—The Air we breathe.

Atmospheric air is composed in its simplest terms of oxygen and nitrogen, mixed but not chemically combined. The oxygen is the great vivifier, the nitrogen being but a diluent, so that the air, as Attfield says, is diluted oxygen. But as we do not drink distilled water, neither do we respire unmixed air. Carbon and hydrogen are always present, and in small quantities they are not at all detrimental to our welfare. The carbon, chemically combined with oxygen, appears as carbonic acid; the hydrogen, also chemically combined with oxygen, forms water or vapor.

As a matter of fact we breathe no air which does not contain these four elementary substances, to wit: oxygen, nitrogen, hydrogen, and carbon.

These are the great feeders of organic life, animal or vegetable, with the addition of certain inorganic, metallic, or earthy substances.

The vegetable world feeds directly upon these elements; the animal world only, or principally, through the intervention of the vegetable kingdom.

Animals do not absorb air as food, as plants do, but they take it in by the lungs to make changes in the blood which are essential to the preservation of life. The air entering the delicate cells of the lungs yields to the used or deteriorated blood there presented to it a supply of vivi-

fying oxygen, while in return it carries off the redundant carbonic acid discharged from the system through the dark blood already used, and now needing renovation. The blood thus vivified by a fresh supply of oxygen, and by the loss of matter which could not be retained longer without detriment, passes to the left side of the heart, thence to enter upon a new course of construction or repair.

For this great purpose we need pure blood; and pure blood, assuredly, needs pure air. We may consider that there is a commensurate ratio between the purity of the blood and the purity of the air. But the air may be vitiated from many sources, and, when so, the influence will be felt by the blood and by the whole system. Animal exhalations and vegetable decay are fertile sources of air-poisoning. There are many living germs or organisms in the air at times or in places sometimes capable of being distinguished, or otherwise only known by their effects, which, inhaled with the air, are productive of important or, it may be, dangerous results.

Whatever consumes oxygen rapidly, without immediate restoration of this element, renders the air more or less unfit for the purposes of respiration. Wherever many persons are assembled with closed doors and windows, the air becomes very impure from causes readily understood. In the first place, the lungs take the vivifying oxygen from the air, and, in the second place, they throw out carbonic acid at the same time in quantities capable of vitiating the air to an extent beyond the power of animal endurance. There are indeed various other exhalations, organic or animal, thrown off, and accumulating to the detriment of all the persons exposed. Noxious gases and organic matters thus remain diffused through the confined air of the apartment until driven off by adequate ventilation.

Some years ago a British emigrant-ship sailed from Sligo for Liverpool with two hundred passengers on board, whose lodging-place was eighteen feet in length, eleven in width,

and seven in height. Heavy weather coming on, the captain sent these passengers all below, and covered the hatches with a tarpaulin which was made fast over them. He thus made the steerage almost air-tight. The wretched passengers, breathing an air immediately polluted, over and over again, were poisoned by wholesale. Some became raving maniacs. The groans of the dying commingled with the curses of the more enduring were unheard or unheeded, until one man managed to force his way on deck, and to call the mate to the fearful spectacle below. Seventy-two were already dead, and many were dying; their bodies were convulsed, the blood starting from their eyes, nostrils, and ears.

Persons rescued from such sources of contamination are very liable to suffer subsequently with low, or, as they are often called, putrid fevers. This is technical *ochlesis*, or crowd-poisoning.

There are minor degrees of poisoning with such agents as carbonic acid, carbonic oxide, and animal exhalations, which are very common, but which are not duly appreciated. The physician often has to inform families that they are bringing untimely diseases upon themselves by clustering in close rooms in winter with windows and doors closed, with gas or other lights at night, and perhaps with an air-tight coal-stove, with the damper turned so as to save fuel. This is a fatal economy. The dwellers in such rooms are not indeed suffocated in a single day or night, but every day or night of such exposure tends to undermine the constitutions of all the inmates. Upon entering such rooms from the open air the offensive and deleterious effluvia are at once observed, but unfortunately habit makes the inmates familiar with the odor, so that it ceases to give warning of a danger which is not the less real for being very insidious.

Close bedchambers are worse than close sitting-rooms,

for in the latter the doors are frequently opened, whereas in the former the doors are usually closed for the night. It is desirable that each sleeper should have one thousand cubic feet of air-space; that is, a clear space of ten feet in all directions. Even this is an inadequate allowance without accession of external air. This ought to be admitted by windows, open fireplaces, or some of the special modes of ventilation now in use. The removal of the old-fashioned outside Venetian window-shutters from modern houses was a hygienic mistake in many regards. They ought to be restored.

Withal, sleepers must be careful about subjecting themselves to the influence of direct currents of air; they should seek a *juste milieu* between such currents and fixed or foul air.

The atmosphere, near the earth at least, is loaded with an infinitude of foreign matters. Particles ordinarily invisible are seen floating in myriads in the sunbeam, and these are composed of all the detritus that comes from the wear and tear of earth, and of the materials used thereupon, and various contributions from the animal and vegetable kingdoms. Many of these matters produce only mechanical irritation when inspired; while others may be, and indeed often are, carriers of disease. What is called *infection* is not infrequently a form of *contagion;* that is, morbid particles, it may be of pus or bacteria, diffused as in ill-ventilated hospital-wards, may carry disease directly from one person to another.

It may be as well to record here as elsewhere an important and simple expedient for carrying off effluvia from gas-lighted apartments, public or private, sick-rooms, or sitting-rooms, which is, to have a tube over every burner, which communicates with a chimney or with the open air.

Dr. Wilson says summarily that the changes produced in an occupied space by respiration and transpiration are the following: "The amount of oxygen is greatly lessened,

the carbonic acid and watery vapor are largely increased, ammonia and organic matter are evolved, and suspended matter in the shape of low forms of cell-life and epithelium-scales is thrown off."—("Hygiene and Sanitary Science.")

Section 2.—Sewers and Cesspools.

These are great sources of air-pollution. Foul air arising from them circulates through many houses, even of the wealthy, carrying the seeds of disease or death. Its fetid odor, formerly attributed to sulphuretted hydrogen (*air puant*), is but partly due to that agent. It is deficient in oxygen, while it is more or less charged with carbonic acid, nitrogen, sulphuretted hydrogen, and ammonium sulphide. Microscopic animal or vegetable organisms have been detected in it.

Whatever the chemical obscurities as to its exact nature, there is no doubt as to its pernicious influence. Dogs and other animals have been made to inhale it, and diseases were induced, corresponding with those affecting the human race similarly exposed. "It cannot be doubted," says Dr. Barker, "that cesspool emanations are, when steadily inhaled, poisonous. The dogs subjected to the cesspool air were more or less affected. The symptoms were those of intestinal derangement, followed by prostration, heat of surface of the body, distaste for food, and those general signs which mark the forms of continued fever common to the dirty and ill-ventilated homes of the lower classes of men." Elsewhere this writer observes: "The symptoms arising from sulphuretted hydrogen" (and the combined agencies) "are well marked, and may be considered specific. *Vomiting and diarrhœa are the first and most prominent symptoms.* The latter is painful, the vomiting is difficult and exhausting, and eventually there are insensibility and entire prostration."

From such facts it is a just inference that many diseases of obscure origin arise from this source. The dogs con-

tracted a form of continued fever with enteric disease. And so human beings exposed are liable to typhoid or enteric fever. *Cholera infantum*, undoubtedly, which makes its annual devastations in our cities, results rather from foul air respired than from any aliments taken into the stomach. These young subjects are from natural causes more impressible than adults, and therefore are more readily affected.

As decomposition goes on most actively in summer, this disease of children is otherwise known as summer-complaint; and it is desirable at this season to get children away from such sources of infection into the pure air of the country.

In winter, closed windows and doors in ill-ventilated houses may cause the house-air to be even more impure than in summer. Outlets must be had, under proper regulations.

The presumption is always against purity of air in cities from the innumerable sources of contamination. "Great cities," says Prof. Stephen Smith, of New York, "are to-day the destroyers of the race. If it were not for accessions from the country they would soon become depopulated."

"A tenth of the people of the cities die of consumption," says Prof. Donaldson, of Baltimore. "Of the rich sixty in a thousand are afflicted with this disease, and two hundred and twenty-three to the thousand of the poor." It is unhappily true that that degree of poverty which deprives people of the ordinary comforts of life deprives them of good health also. "Sedentary life and inactivity, impure air, and the absence of sunlight in cities, produce a fearful mortality from consumption. No exciting cause is so general as in-door occupations." If the surplus population of the cities were scattered over the country, and engaged in agriculture or horticulture, there would be incalculable gain, to all concerned, in health and prosperity.

Langenbeck, the great German pathologist, asserts that pulmonary diseases are almost entirely due to the breathing

of foul air. "The lungs of all persons," he says, "miners included, who had worked for some years in close workshops and dusty factories, showed the germs of the fatal disease; while confirmed inebriates, who had passed their life in the open air, had preserved their respiratory organs intact, whatever inroads their excesses had made on the rest of their system. If I should go into practice, and undertake the cure of a consumptive, I should begin by driving him out into the *Deister*" (a wooded mountain-range in Hanover), "and preventing him from entering a house for a year or two."

As our fellow-citizens cannot conveniently go to the Deister for a couple of years, they must make up for this deprivation by seeking pure out-of-door air as far as practicable, whether by going to the country, or to city parks, which are said to be the lungs of dense population, or by other expedients. They must take care also to let fresh air into the houses, at all seasons, with discretion, of course, as to the method.

Withal, cities are not altogether pestiferous. It is a saying that three generations in Paris extinguish a family, unless recruited from without. The saying is not necessarily true. The health of London has been so improved of late years by hygienic measures that the mortality in that city is less than the average mortality of all England.

Dr. Richardson proposes an ideal "city of health," whence, by good sanitary regulations, all preventable diseases would be banished; or, rather, where they would never gain a foothold. Such inflictions as "delirium tremens, liver-disease, alcoholic phthisis, alcoholic degeneration of kidney, and all the varied forms of paralysis, insanity, and other affections due to alcohol, would be completely effaced. The parasitic diseases, arising from the introduction into the body, through food, of the larvæ of the entozoa, would cease, and that large class of deaths from pulmonary consumption, induced in less favored cities by exposure to

impure air and badly-ventilated rooms, would, I believe, be so reduced as to bring down the mortality of this signally fatal malady one-third at least."

Such model cities are as yet only in Utopia, where one

> "May feel the present Deity, and taste
> The joy of God to see a happy world!"

But doubtless improvements may be made approximating the ideal so as to make the masses who dwell in cities healthier and happier, in far better physical and moral condition, than at the present day.

Section 3.—Ozone.

This form of oxygen, which is considered to be more or less a proper constituent of atmospheric air, is comparatively absent in cities on account of the dust, exhalations, and matters of ready oxidation, by which it is destroyed. It tends to purify at the same time, by destroying the low organic remains with which it comes in contact. It is not rare on the sea-shore, on mountains, or even in the open fields, but its influence upon health is so little understood that any extended consideration of it in these pages may be dispensed with. When designedly inhaled it produces irritation of the nasal passages, and more or less of catarrh. It is probably influential in causing catarrhal affections in cool weather, or indeed, as Dr. Richardson believes, whenever the temperature is below 75° Fahr. Above this temperature it exerts little or no appreciable influence.

Section 4.—Malaria.

This is a subtile cause of disease, of almost unlimited prevalence. Literally, malaria is only bad air, but conventionally it is a bad air having peculiar properties. From its wide diffusion, Dr. Miller, of New York, proposed the term *koinomiasmata* for those exhalations from the earth,

otherwise known as miasms, malaria, or marsh-poison, which give rise to certain periodical or malarious diseases.

Heat, moisture, and vegetable decay, in their combination, are the factors usually productive of malaria ; and malaria is a poison, or conveys a poison, which, according to its concentration or dilution, and other circumstances, may prove speedily fatal to persons exposed, or may merely cause some trifling indisposition. The usual result of exposure to malaria is intermittent or remittent fever. It prevails mostly in low and swampy regions, and it is therefore often spoken of as marsh-miasm. Given low grounds, sometimes inundated and sometimes uncovered, with summer heat and vegetable decay, malaria may be considered a certain product, and malarious diseases in some form a certain result. The malarious malady may be intermittent or remittent fever, from a mild to a pernicious type, or neuralgia, or diarrhœa, or dysentery, or some other form of disease, with pretty surely terms of exacerbation and abatement. Although we know so well where and under what conditions malaria is developed, we do not know its intrinsic nature.

A man may live a long way from marsh, mill-dam, or sluggish stream, and yet have his homestead penetrated by this subtile poison by allowing the conditions to exist on his premises. Decaying vegetable matter in his own cellar may be the obvious producing cause.

Otherwise, malaria may be brought from a distance by prevailing winds, though fortunately the greater the distance the greater the dilution, and consequently the less deleterious influence.

It is most active at night, and especially just after and just before the rising of the sun. In malarious regions there should be no voluntary exposure at such time. Fogs carry and diffuse malaria ; the mid-day sun, as it rarefies the air, disperses, dilutes, and diffuses it too. Breakfast, or even a cup of coffee, to say nothing of the powerful cin-

chona-bark, taken before morning exposure, is measurably protective. Persons dwelling in a house near a source of malaria should keep the side of the house most exposed closed at night, while they may with comparative impunity leave windows open or otherwise let in air on the side not directly exposed. Woodlands between habitations and malarious regions give great protection. Various growths give some degree of protection ; this is alleged of the common sunflower (*Helianthus annuus*), when grown freely about the premises. The eucalyptus-tree has the highest reputation in this regard, but unfortunately it will not thrive in any region subject to severe winters. From the Carolinas southward it will doubtless rescue many fertile regions from the destroying influence of malaria, and thereby convert waste lands into productive farms. In the fatal Campagna near Rome some French Trappists redeemed an old abbey-farm, long abandoned on account of unhealthfulness, by planting the eucalyptus freely over the premises. They now live in the enjoyment of good health on the farm, which is under successful cultivation.—(*Sanitarian*, September, 1876.)

Although the producing causes of malaria are so well recognized, it sometimes shows its influence far away from sources of ready recognition. Very formidable malarious fevers may appear without the concurrent presence of the ordinary factors, to wit, heat, moisture, and vegetable decay. Thus high up in the Rocky Mountains, in cold and arid regions, there is a *mountain-fever* which has all the characteristics of malarious fever. But how can a malarious fever exist where there is no malaria, and no cause capable of producing it? This has long been a *crux* in etiology ; but it may be properly answered by the assertion that there is no malarious fever independent of the known cause which is malaria. This noxious agent, however, may find its way into the system not only from the air, but also through the water we may drink, when impreg-

nated with it. The poison may be, and surely is, often wafted far overhead until it reaches the clouds which become charged with it, and which discharge it in rain or snow. This matter has been ably set forth by Dr. Charles Smart, U. S. A., who had ample opportunities of studying the mountain-fever, its causes, nature, and treatment.

This careful investigator found in the various river-waters consumed by the troops where the fever prevailed, .19, .20, and .28 per million of ammonia from the nitrogen of dissolved organic matter. He at first supposed this to be derived from the decaying vegetation in the rivers or their feeders. "But this theory was scarcely tenable in the face of the fact that streams running in a rocky bed, and with but little vegetation near their radicles, were found to be nearly as much impregnated as those which had a slower course in the tangled brushwood of lower-lying valleys."

He was led to examine the first snow that fell, and found that *it contained nearly twice as much organic matter* as the average of the river-waters examined.

He continued investigations, which led to the detection of the origin of the organic taint in so-called pure streams: that "it consisted of vegetable emanations and *débris* swept up by the winds from the face of the continent, and precipitated by cold and moisture along with the snow from the higher regions of the atmosphere."

The mountain-fever (remittent) recurred in the early spring when the stream which furnished the water-supply to the post was swollen to thrice its usual volume by the melting snows, and charged with the larger amount of organic matter which the predominance of snow-water gave to the stream.

"Rhetorically," says Dr. Smart, "we make use of snow as a symbol of purity. Dr. Parkes, however, informs us that 'there has long been an opinion that snow-water is unwholesome, but this is based on no reliable observation.'"

Dr. Smart made careful observations, and found in snow-flakes some .30 part per million of free ammonia, and .50 part organic ammonia. "A non-malarious country is affected at a certain season with a malarious disease; this season corresponds with the contamination of the drinking-water by vegetable matter brought from distant regions. Swamp malaria is known to be transported by winds. It is known to rise mist-like and to be wafted mountainward from the valleys in which it is exhaled. And if more ponderable matter of vegetable origin be carried into the higher strata of the atmosphere to be subsequently swept down by the snow-fall, why may not malaria accompany it?"

It is fortunate that rain and snow bring down to earth malaria (and other noxious agents) which would accumulate "as a pest-cloud enveloping the earth" but for the washing thus given to the atmosphere whereby it is cleansed and purified.

The mountain-fever is most active when the streams are full from rain and snow fall, whereas it is absent during the months of September and October, "and these are the months when the stream"—which supplies the post with water—"is at its lowest and purest, so far as it is a question of organic impurity."

The fever did not arise from the influence of high temperature, for, when the ground was covered with snow, it was abundantly active. "The Fourteenth Infantry during the early part of their campaign were several times obliged to camp near bad water—melted snow collected in natural tanks—and during the latter part the water-supply for all culinary and camp purposes had frequently to be derived from the snow covering the earth. Here the increased prevalence of mountain-fever at Fort Bridger during the month of January may be referred to, and attributed to accidental circumstances of a character similar to that which gave Camp Douglas a series of cases in January, 1877."—(*American Journal of Medical Sciences*, January, 1878.)

All hygeists agree that malaria may be absorbed by water, which, when taken into the stomach, is capable of exerting its noxious influence. The bad air, the malaria, is brought back to the surface of the earth from which it arose, and thus, concealed in drinking-water, far away from its origin and producing causes, it gives rise to the distinctive diseases of which it is known to be, far or near, the *fons et origo*. "Forewarned, forearmed." A knowledge of the facts gives indications for the prevention of evil results.

When the malarious poison, whatever it may be, is brought down to the earth, a goodly portion falling on the paved streets of cities is at once washed off by surface or sewer drainage. Some, however, is absorbed into the earth even in cities, and a greater quantity of course in earth not stone-clad with pavements. Turning up the soil by shovel, spade, or plough, often sets free malaria, and gives rise to the consequential diseases. A few years ago, a new railway company was engaged in trenching and tunneling a track through a portion, partially suburban, of the city of Baltimore, and for one or two years malarious diseases were rife where hitherto and since they have been rarely observed.

Malaria causes an immense proportion of human disease, and gives no immunity from, nor protection against, other diseases. Fortunately there are known methods of hygiene and prophylaxis which are competent to check its spread and influence, and in the course of years it is probable that it will be little known or felt in communities of high civilization.

Section 5.—Animal Emanations.

The effluvia from decaying animal matters are very capable of conveying disease, though it is not easy to get exact knowledge as to their potency in this respect. Some workmen earn their subsistence in the midst of animal decay without appreciable injury; while, on the other hand, ani-

mal putrescence notably causes the spread of diseases. A curious fact is related in regard to a dissection made of a putrid liver, by a student of medicine when a candidate for degrees, in Paris. He protested against the work, but performed it. The result in his case was a fever which went off in a heavy sweat; but one of the by-standers was taken with a fever which proved fatal, while others were attacked with a burning exanthematous fever from which they slowly recovered.

Poisonous animal miasmata give rise to continued fevers, wherein they differ from marsh miasmata. Dr. Parkes records that in the French camp before Sebastopol, when numbers of dead horses lay putrefying and unburied, the effects were so serious that the spread of typhus was supposed to be due to this cause.

As all putrid effluvia are dangerous, or may become so, it is necessary to have the sources removed from human habitations. Too much confidence should not be given to deodorizers, which not infrequently only conceal foul odors, without impairing the potency of the deleterious agent with which they are associated. The source of all foul odors should be traced, and if possible removed.

Section 6.—Devitalized House-Air.

One often observes, upon entering a house, that the air wants freshness, besides being loaded more or less with extraneous matters. Sometimes there is coal-gas, or carbonic oxide, as we supposed, until better informed by Prof. Remsen, of Johns Hopkins University, and sometimes leakage from the gas pipes or burners, both of which are abundantly deleterious, to say nothing of the danger of accidents. "Hydrogen is a prominent constituent of all the substances used for producing artificial light, such as tallow, oil, and gas. The explosive force of large quantities, such as a roomful, of coal-gas and air, though vastly below that of an equal weight of gunpowder, is well known to be sufficient, at least,

to blow out that side of the room which offers least resistance."—(Attfield.)

While writing these pages, an accident happened in Baltimore which may serve as a caution to the unwary. An old lady came from the West to take passage in a German steamship, for the purpose of revisiting her native land. She took a room at an hotel, and, upon retiring, blew out the gas before going to sleep. She went to sleep—to the sleep that knows no waking—for in the morning, as she failed to make her appearance, an attendant went to call her, and found her quite dead, in an atmosphere of gas which would probably have exploded if approached with a lighted candle.

Dr. Richardson, in a few graphic touches, shows what is by far too common in every community :

"In many private houses, houses even of the well-to-do and wealthy, streams of devitalized air are nursed with the utmost care. There is the lumber-room of the house, in which all kinds of incongruous things are huddled away and excluded from fresh air. There are dark under-stair closets, in which cast-off clothes, charged with organic *débris* of the body, are let rest for days or even weeks together. There are bedrooms overstocked with furniture, the floors covered with heavy carpets, in which are collected pounds of organic dust. There are dressing-rooms in which are stowed away old shoes, and well-packed drawers of well-worn clothing. There are dining-rooms in which the odor of the last meal is never absent, and from the sideboard cupboards of which the smell of decomposing fruit or cheese is always emanating. There are drawing-rooms in which the scent of decayed roses, or of the varnish from the furniture, or of the dye from the table-covers, is always present. There are kitchens in which there is the odorous indication of perpetual cooking. There are sculleries where the process of 'washing-up' seems to be in permanent action, and where the products of change from stored bones, potato-parings, recent vegetable green food, and other simi-

lar refuse, are abiding. There are water-closets in which there is, at any time of day or night, a persistent, faint ammoniacal odor."

Such matters are not adduced merely to show what exists; the prudent housekeeper may take the hint from them as to what ought to be done. No decomposition, no odors, must be allowed to pervade the house. Decaying matters must be removed, and air must pass freely through every chamber. Sunlight ought to be admitted for a portion of every day. "The sun's rays not only prevent dampness and mustiness, but they purify the atmosphere by destroying organic matters," says Prof. Donaldson.

In private houses generally ventilation is accomplished mostly through windows, doors, and open fireplaces, without special or peculiar arrangements. We must use them as we have them, in winter as in summer, and still with prudence, so as not to throw draughts upon the occupants of the rooms. More fuel will indeed be used in winter, but, as the professor just quoted forcibly remarks: "Fresh air is better worth paying for than even food; it is more essential to health."—("House-Air the Cause and Promoter of Disease.")

Dr. Van Bibber, of Baltimore, suggests as an important sanitary improvement the general removal of fences, especially the board fences so common between neighboring houses or lots in our towns and cities. Lots thus inclosed are often made receptacles for waste-matters that ought to be removed far away, and from the confined air in these inclosures the dwelling largely draws its supply. The removal of the fences, by allowing a free sweep of the winds, would undoubtedly be a great sanitary gain. Wire fences might be used to protect property, but privacy would be lost, and every sight and sound in each inclosure would be common to a whole neighborhood. Thick-set hedges would be no little improvement on the fences, but perhaps the best measure practicable at present is that the corporation re-

quire official sanitary inspection at reasonable intervals, with the power of enforcing cleanliness on the premises.

With all known expedients we cannot make house-air as pure as the surrounding atmosphere in its ordinary condition. Let any one lying in a commodious bedchamber of a still summer night with open windows approach a window and lean over in the outer air to try what may be the difference. It is such that a return to the bed in the centre of the room seems like going to voluntary suffocation. A child in the cradle, half smothered with injudicious surroundings, will toss or fret or cry by the hour in a spacious nursery. Carry it out on the porch, it will fall into a sweet sleep; bring it in, and more fretting and crying. The child is suffering for vital air, and has no other way of expressing itself—*hinc illæ lachrymæ.*

The stall-fed cows about Paris, according to Bouchardat, become tuberculous; those ranging the fields do not. Our race cannot go back to the primitive times and sleep in the open air like our first parents, on beds of flowers; in this respect, beast and bird—

"They to their grassy couch, these to their nests"—

have some advantage over us; but men should take to themselves and give to their wives and children, especially to their young and growing children, the free use of sunlight and fresh air out-of-doors up to their possibilities. The air of the house should be kept pure also up to the possibilities. And furthermore, the house-air when too moist, too charged with vapor, should be dried preferably by open fires; when too dry, moisture should be introduced by the well-known and familiar expedients.

Air-tight closets in houses should be dispensed with. Lattice or wire doors should replace solid doors. Movable articles, as clothes, beds, and bedding, should be exposed from time to time to the purifying agency of the sun in the open air.

CHAPTER III.

WATER.

We may now consider the qualities and use of drinking-water, which demand attention during the whole term of existence. Water is so much a necessity that dry food would sustain life but a very short time without its thirst-quenching and solvent powers. Like atmospheric air, it must be pure, that is, free from deleterious admixtures. Absolute chemical purity is not desirable; man does not want or desire distilled water as his usual beverage, but he does want water which shall not contain any noxious elements. It is related that Peter the Great, of Russia, once gave and enforced an order that the male children of his seamen should be obliged to drink sea-water, for the purpose of accustoming them to it, so that they could bear the deprivation of fresh-water, when themselves serving in his navies, during any scarcity of that important commodity! His nursery of seamen perished in the experiment.

It is but of recent years that scientific investigation has been showing to the world how large a proportion of its population has been poisoned, more or less fatally, by the use of impure water. This has been effected upon the largest scale in the great cities, where people have consumed water from rivers polluted by all imaginable and unimaginable filth; or from wells, the waters of which were contaminated by washings from all the excreta of dense population. The most conspicuous instances have been shown in London, where cause and effect have been most carefully traced. All kinds of enteric diseases, includ-

ing typhoid fever and cholera, and many others, are diffused through communities by the use of contaminated drinking-water. No pump-water should ever be considered potable in cities; and even about country-houses care must be taken that the well is not a receptacle for matters that modern science, as Mr. Chadwick maintains, would utilize by applying them to the surface of the earth.

Filters.—Good water-filters should be brought into general use in town-houses, which usually receive their supplies from sources not above suspicion. The *silicated carbon* filters are probably the best in use. Where malarial contamination of water may be present or suspected, producing what has been called *aqua-malarial* fever, filtering and boiling before use would be eminently advantageous.

Ice.—Upon a theory that "dirt does not freeze," *ice* is supposed to be intrinsically pure, but this is a great mistake. It is quite capable of entangling impurities, and of transmitting disease. A remarkable instance of this was reported two years ago, by Dr. Nichols, attending physician at Rye Beach, New Hampshire. Many persons at a large hotel were attacked with enteric disease, the source of which, for a time, was very obscure. But when the ice-supply came under observation, it was found that ice used at that hotel was brought from a neighboring pond, which, when stirred in warm weather, gave off an intolerably offensive odor. This was due to decomposing sawdust in marsh-mud. Prof. Nichols examined some of the melted ice, and found it charged with decaying organic matter, which he considered to be quite adequate to cause the extent of disease which had followed its use. With its disuse, the attendant diseases disappeared. "The notion," says Dr. Nichols, "that ice purifies itself by the process of freezing, is not based upon trustworthy scientific observation. On the contrary, it is utterly wrong in principle to take ice for consumption from any pond the water of which is so fouled as to be unfit for drinking purposes."

Lead in Water.—Workers in paint and in lead-works generally are often poisoned by lead, so that in all such works, its effects being known, measures are or ought to be taken to counteract its injurious influence. Lead-poisoning affects the nervous and the digestive systems. Colic of an obdurate kind, and a peculiar form of paralysis, are more or less characteristic. But many persons are affected by lead who have no suspicion of exposure to its influence. Some of the forms are occasionally added to wine, cider, and other beverages, by fraudulent dealers. But, moreover, it is not an uncommon contamination in drinking-water, being derived from the lead pipes through which it passes. Chronic indigestion, obstinate colic, and nervous disturbances, occurring to several members of the same family, should always induce investigation as to the introduction of lead into the system through the water-pipes or other agencies. As lead is so convenient in some respects, measures have been taken to continue its use without the attendant dangers ; and a composite pipe is now made of lead lined with pure block-tin, by which safety and convenience are both maintained.

Good water should be bright and clear, and odorless. Its good qualities should be looked to for man and beast. It must not be supposed that we can be indifferent to the water used by our domestic animals. Our interest in it is "very direct. In White's Compendium of Cattle-Medicine" great stress is laid on "the propriety of supplying cattle with pure water—not only for the health of the animals, but, so far as cows are concerned, *for the quality of the milk, butter, and cheese.* Mr. White gives examples of the improvement of cattle by means of a good water-supply."

The writer has italicized a few words, to call attention to their extreme importance.

Some people are intemperate in the use of water. The following quotation from Dr. Balbirnie may give a useful hint in this respect : "In the healthy, drinking during a

meal aids digestion, if the solid matters be of a nature to require it; and, on the other hand, it impedes digestion if the quantity taken renders the mass too liquid. The healthy may safely trust their own sensations, which are often safer guides than any abstract principles. But to the dyspeptic we say, do not disturb digestion by undue dilution of a meal, or too soon after it. This relaxes the coats of the stomach, impairs its secretions, and paralyzes its movements. By drinking little at a time, the risk of exceeding proper limits will be avoided."

Americans, beyond all people, are devoted to the use of ice-water. A Scotch physician, Dr. Whitelaw, says: "Cold water, unless in small sips at intervals, should not be drunk when the body is hot and fatigued; as either inflammation, or shock without reaction, may be the sad result. The shock is carried to the heart by the intimate nervous connection between the stomach and that organ."

Cold water in Scotland is probably a much milder drink than in America. We must make an earnest protest against the habit so common among Americans, of drinking something as near to liquid ice as can be obtained. Water moderately cooled with ice is a wholesome and appropriate drink, used with ordinary discretion, but when made intensely cold its use is hazardous, and may be disastrous. It should not be allowed to children even remedially, for, as a remedy, ice (clean and pure) is more appropriate, since, while it reduces animal temperature, its gradual solution saves the gastric nerves from sudden shock.

The public intelligence has to be aroused in regard to drinking-water, and many eminent writers are bringing the matter under notice. Dr. Bowditch, after extensive research, says: "Only one-third of the towns and cities of this nation make any claims, even the most trivial, of endeavoring to procure pure potable water for their inhabitants. The remainder, 65.73 per cent., either confess carelessness or ignorance of the subject. In other words, over

one-half of the people of these United States are openly and avowedly living in a senseless disregard as to whether they are drinking pure water or water contaminated by every kind of filth. We may be quite sure that such recklessness in regard to human life will not exist a half-century hence." —("Centennial Discourse on Public Hygiene and State Preventive Medicine.")

If the prophecy be fulfilled, its accomplishment will be largely due to the enlightened work of this eminent sanitarian reformer.

CHAPTER IV.

CLOTHING.

From the standpoint of the hygeist, clothing is intended to preserve an equable temperature about the surface of the body. In winter, by retaining the animal heat, it protects us from external cold. In summer it protects us from the powerful rays of the sun. Animal temperature is nearly invariable, while the temperature of the external air varies, taking an annual range, we may say, of 150° Fahr. In a single day we may have, though rarely, a range of 20°, 30°, or even 40°. These variations try the system severely—beyond its powers of endurance, indeed, without the protection of clothes. A man ill clad and exposed during a severe winter's night perishes with cold; and likewise a man exposed, with head ill protected, to the powerful rays of the summer's sun, is liable to be smitten with sudden death.

The virtue of clothing may be principally estimated by the conducting or non-conducting properties of the materials. A linen shirt takes warmth and moisture from the body and discharges them rapidly into the surrounding air. Thus this garment is equally pleasant and appropriate for a hot summer's day. A woolen shirt, on the contrary, takes heat and moisture but slowly from the body, and discharges them slowly; therefore a woolen or flannel shirt is the proper garment for winter or for cold weather.

These general propositions are correct, but they are not of uniform application. If the cold of winter stood uniformly at about 30° Fahr., and the heat of summer uni-

formly at 80° Fahr., we could adopt flannel and linen as absolutely appropriate to those seasons, winter and summer ; but since there are rapid changes not only from season to season, but during many individual days of any and every season, such method must require modifications. As linen is such a ready conductor, it is not the best material for underclothing, even during midsummer, for delicate or sensitive subjects. However pleasant it may be to the wearer when the thermometer stands at 75° or 80°, it will give very defective protection if there occur a sudden fall to 65° or 60°, which is by no means uncommon. By rapid conduction of heat and moisture from the body, it increases the sense of chilliness, and may thus aid, rather than check, the evil effected by sudden change. It is, therefore, in a variable climate, not quite a safe article of underclothing, even in midsummer. It makes an excellent outer garment indeed, on account of its lightness and its reflection of the sun's rays ; and, moreover, as an outer garment, it may be conveniently changed at a moment's warning.

Cotton holds an intermediate place between linen and wool. It does not absorb heat and moisture so readily as linen, and there is less evaporation from it. From high temperatures it does not protect so well as linen, nor from low so well as wool, but in some respects it has advantages over both. Thus it gives better protection against summer vicissitudes than linen does, while it does not stimulate cutaneous action like flannel. A sensitive skin is stimulated to overaction by a woolen shirt with an undue increase of perspiratory matter. It may thus happen that cotton worn next to the skin during the summer will be a better safeguard to health than either of the other two textures.

Merino, made of cotton and wool, is a good combination for intermediate use.

Silk in former times was appreciated, perhaps too highly, for underwear. It is probably only superior to cotton

in being more pleasant to the sense of touch. It is certainly much safer than linen, especially for rheumatic subjects.

Wool merits precedence over these various materials. It may be prepared for all climates and for all seasons. From the equator to the poles woolen garments may be said, in general terms, to be the best. In the tropics, and in regions eminently malarious, persons wearing flannel find a degree of immunity not given by clothing of other materials. This fact has been abundantly demonstrated among seamen serving in East India and other tropical seas. The merits of the flannel *cummerband* are fully appreciated by all Americans or Europeans serving or dwelling in the East Indies.

What Nature accomplishes for the birds of the air and the beasts of the field, with man is left to his discretion. Birds and beasts are not stripped in summer ; they still retain their clothing, only being lighter in summer and heavier in winter. Aries sheds his superabundant fleece in the spring, if not clipped by the thrifty hand of the shepherd, and with his offspring, "the shorn lamb," he wears a light woolly coat for the summer, which grows duly heavy for the untempered winds of the ensuing winter.

Woolen garments by their porosity allow the escape of emanations from the person, though this porosity does not encourage a rapid escape of heat. Dry air is a capital non-conductor, and the meshes of the wool entangle the air, so that it remains about us, retaining to a great extent the natural warmth of the body. Wool has some remarkable hygrometric properties. It is competent to absorb a considerable degree of moisture, and render it latent. This hygrometric water may be discovered by weighing the fabric before and after desiccation ; it is not appreciable to the senses.

Certain water-proof fabrics have been brought largely into use during the last quarter of a century. Their advantages and disadvantages ought to be understood. They

should not be worn next to the skin, as they arrest insensible perspiration and other exhalations, and cause the person to be bathed in an unwholesome and uncleanly sweat. If worn as overalls they are less objectionable, inasmuch as some of the surface emanations are absorbed by the undergarments, which, if of wool, being hygrometric, retain them for a short time without risk ; but they should only be worn for a short time, and should be very loose, so as to allow escape or change of air. Water-proofs used without discretion are productive of rather than protective against rheumatism, and even more formidable diseases. Most persons have found that rubber shoes, worn for consecutive hours, make the feet damp instead of keeping them dry. Such shoes should only be worn for brief exposure to snow or rain.

The color of clothes is worthy of consideration. Light clothes reflect heat, dark clothes absorb it. Black absorbs odors and deleterious matters more than white ; therefore, dark dresses are least appropriate in the presence of contagious diseases.

Adaptation.—The fit or adaptation of clothes to the person is a very important matter. The clothes should allow free play to all the movements of the person, and unobstructed flow of the circulation of the blood. Men should never wear tight-fitting cravats, nor allow any binding from shirt-collars. Some years ago many British soldiers fell victims to close military stocks, which, obstructing the easy return of the blood from the head, produced cerebral congestions and apoplexy. When ladies compress the waist and chest, they do so to their own detriment in all directions. To detail the injuries done would be to go to no little extent into descriptive anatomy, soon merging in morbid anatomy. Tight-lacing, now less common than formerly, not only disfigures the individual woman, but it is a wrong to humanity. M. Chomel says satirically of the French ladies, "*Aucune femme ne se serre.*"

Prof. Gaillard Thomas, of New York, shows, in a few graphic touches, what evils befall the sex from *improprieties of dress*, in his work on "Diseases of Women;" but, as we do not propose to discuss diseases, but only the means of avoiding them, we will merely offer the reminder here that many diseases do follow such improprieties, and suggest that ladies should be true to their own interests rather than to any behests of fashion.

Dr. Washington L. Atlee, of Philadelphia, made an address before the Pennsylvania Medical Society, in which he endeavored to bring ladies to a good standard of dress. "Look at that interesting, delicate girl, pallid and wan, struggling wearily under a weight of clothing which the strongest of our sex would not tolerate ; all suspended, not upon her shoulders, but upon her necessarily constricted waist." This "beautiful peafowl" walks abroad dragging after her cigar-stumps, quids of tobacco, and street dust or mud, and, when she reaches home, "her costly silk or satin skirts are smeared, her stockings soiled, and her limbs wet and cold. . . . But this is not all. Follow in the footsteps of this fair one, and examine the imprint of her shoes, the heel-mark scarcely larger than the thumb-nail, then a skip, and then again the impression of a very narrow sole. Measure her tiny track. Behold ! it is only five or six inches long ! What a celestial foot for so stately a maiden ! Now examine her shoe—a heel about two inches high, shaved down almost to a point, and planted forward almost under the instep. . . . Let us glance for a moment at these dogmas of fashion. Examine a lady in full dress thus poised : high heels and a constricted waist supporting from ten to thirty pounds of merchandise ! She cannot if she would maintain a perfectly erect position. Look at her figure ; her heels are tilted up, she is partly on tiptoe ; the feet, head, and shoulders, are thrown forward, and the hips must necessarily take an opposite direction to maintain the proper equilibrium. Why, this is a caricature, a burlesque

on female beauty! But when she stands forth as God has made her—erect in her fine proportions; with her full, finely-chiseled bust; her ample waist responding naturally to every inspiration; animated by the glow of vigorous health; and clothed so as not to clog any vital function nor hide every grace—and walks forth, as only she can walk who practically recognizes the physiology of the foot—she carries herself with true majesty; she is 'a thing of beauty and a joy forever,' and we bow down in admiration to the most beautiful object in creation."

We think Shakespeare says, or hints, that the ladies love the approbation of the gentlemen, and, if this be so, they ought to justify this enthusiastic admiration by preserving their forms as God has made them, instead of vainly getting up caricatures or burlesques on female beauty.

The *chaussure* is a very important matter. The writer knows ladies practically retired from society on account of suffering feet, sacrificed to fashion. He knows some who directly and justly accuse the fashionable shoe of giving them terrible pains in the limbs and loins.

Easy-fitting shoes and boots, with broad soles, and sufficient heels in the proper place, are necessary equally to health and comfort. In summer, a tight shoe compresses the foot very painfully when swollen by heat; in winter it checks the surface circulation, which is necessary to the preservation of the animal heat of the surface, and thus chills the foot and predisposes to the destructive influence known as *frost-bite*. When the foot has a certain amount of play in the boot, the circulation is unimpaired, and there is furthermore a stratum of warm air playing between the foot and the leather. The tight boot, by impeding circulation, and by allowing no room for this confined air, may effect irreparable mischief. A boot or shoe, so far as hygiene is concerned, should fit easily, not too tightly, for reasons just stated, and not too loosely, as the rubbing of the foot in a very loose shoe is attended with one of the

evils of a cramping shoe—that is, it causes corns and bunions. The sole of the shoe should be at least as broad as the whole sole of the foot when spread out ; and the shoe should be longer by a half-inch or more than the foot, to allow for the degree of extension which always takes place in walking. Many persons have occasion to remember that a shoe which appeared sufficiently long in the shoe-shop, while the foot was at rest, gave pain ever after in walking : this is explained by the fact that no allowance was made for the extension which is natural and necessary in motion.

The writer has known tight shoes to give rise to paroxysms of gout in the predisposed. Sandals or gum soles may be worn on shoes where persons have to walk for a long time on damp pavements. They prevent the absorption of moisture, while they do not restrain or retain exhalations as gum shoes do.

In speaking of the *chaussure*, a passing remark may be made upon a danger lurking in stockings, of comparatively recent origin. Persons of delicate skin have suffered sometimes both locally and generally from the effects of the dyes in colored stockings. The aniline dyes used, generally of red or yellow tints, are capable of poisoning the skin, and even to some extent the whole system. The dyes may indeed exert their influence through any clothing in contact with the person. Dr. Richardson gives an instance of a young gentleman who consulted him for what was considered a rapidly-developed attack of erysipelas on the chest and back. He was covered with an intensely red rash, and he was affected with nervous symptoms, with faintness and depression of pulse of a singular and severe kind. The doctor traced both the local eruption and the general malady to the effect of the organic dye in one of those red woolen chest and back comforters which are commonly worn in cold weather. On removing the comforter all the symptoms at once ceased.

These dyes, wherever they come directly in contact with

the skin, are very objectionable, though fortunately not readily absorbed. It is probable that their influence is most commonly exerted when in the stockings, on account of the perpetual movement and friction about the feet and legs.

The Head-Dress.—Custom and fashion among "enlightened" nations require the use of hats and bonnets that are more for show than for comfort or protection. In this matter the Chinese and the Turks might give us some useful lessons. Their head-dress does give protection. The fashionable hat worn by an American protects the crown of the head partially, but leaves the ears and the occiput thoroughly exposed. Unless ventilated, as some are now, it keeps the head in an atmosphere of confined air which readily becomes impure and harmful.

Our summer hats are better. The light straw shelters the head, while it reflects the sun's rays; and the broad brim measurably shades the eyes. Persons much exposed to the sun will find a great advantage in carrying a handkerchief in the hat, or, even better, a wet sponge, or green leaves.

The Turk's turban and the Chinaman's conical bamboo hat are far better than our male head-dresses, and we commend their introduction to the fashion-makers. As ladies' hats and bonnets do not seem to be intended for any use, but only for ornament, we will not discuss them. We may put in one word of commendation, however, for the *nubes*, or other such becoming head-dresses which the ladies often wear at night when going to evening entertainments. These may be made to protect at once head, ears, neck, and throat of the wearers, and to save them from attacks of neuralgia or more formidable maladies.

CHAPTER V.

EXERCISE OR WORK.—INFLUENCE OF OCCUPATION UPON LONGEVITY.—LIMIT TO LABOR.

Section 1.—Exercise or Work.

"In the sweat of thy face shalt thou eat bread. . . . With labor and toil shalt thou eat thereof all the days of thy life."

Here is an injunction from which man can never depart widely with impunity. The physical frame will perish unless in some way it be kept in action in general, and in its various parts. Work and rest, as pleasure and pain, are important among the component parts of human existence.

"The first divine law of Nature," says the philosopher Schlegel, "if we may so speak, by virtue of which labor and struggle became from the beginning the destiny of man, has retained its full force through all succeeding ages, and is applicable alike to every class and every nation, to each individual as well as to mankind in general, to the most important as to the most insignificant relations of society. He who weakly shrinks from the struggle, who will offer no resistance, who will endure no labor nor fatigue, can neither fulfill his own vocation, whatever it be, nor contribute aught to the general welfare of mankind."

Labor may be wearisome, but it is not so wearisome as idleness. Besides, the weariness of labor, when not excessive, brings wholesome sleep, good appetite, and good digestion. "The sleep of the laboring-man is sweet, whether he eat little or much; but the abundance of the rich will not suffer him to sleep," says the wise man.

There must be physical exertion, and that in no stinted

measure. Where the bread is not earned by the sweat of the brow, physical culture becomes a necessity. It must be a matter of education in early life, and habit in after-life. Mind is superior to matter indeed, but mind must have a basis to rest upon. The nervous maladies so prevalent and so damaging among our females would be greatly abated by changing some of the school-hours of girls to hours of exercise in the open air. Walking is one of the best forms of exercise, which may be varied, when practicable, by riding on horseback. Walking develops the lower limbs, while riding, somewhat briskly, tends to develop the muscles of the arms and chest. Both forms promote capillary and secretory action. Both give successions of shocks, more or less felt, to all the organs of the living frame. Thus absorption and nutrition are promoted, and waste and repair go on energetically. Deep inspirations, induced by physical efforts, by a well-known physiological process involving the relations between the hepatic and cardiac circulation, promote portal circulation, and thereby stimulate hepatic function; or, in other words, exert a true cholagogue influence.

Smart and vigorous exercise should be taken every day, in open air if possible. A walk, a ride, a drive, rowing, boating, the use of clubs or dumb-bells, and such measures, are suitable for persons who do not work manually for their daily bread. When a student wearies of books, of reading or writing, he should turn aside from them for a time, to exert his muscles. The change soon relieves mental weariness and the cramped and contracted sensation about the chest that attends upon a prolonged session. Mr. William Cullen Bryant was in the habit in the summer of doing some light work on the farm or in the garden, as a relief to study. He very prudently, however, avoided over-heavy or fatiguing labor. Violent exertion is never necessary for health; in some respects it is more dangerous than keeping quite at rest, the error of the other extreme.

Passive Exercise.—There are persons not equal to any active exercise, who are benefited by the passive forms, such as riding in an easy carriage, or sailing on smooth waters. These do not directly promote muscular vigor, but by affording change of air and scene they are often of great benefit to invalids and children. We often see, in Baltimore, children in a state of extreme exhaustion, apparently almost in a dying condition, as from summer-complaint, marvelously revived by a steamboat excursion on the Chesapeake, or going away for a few miles on the cars. Other causes no doubt coöperate in this happy result, as change of air and scene, but the very motion is beneficial. Delicate persons will rarely bear, in fact, any severe exercise. The exhaustion which follows imprudent attempts is more pernicious than the exercise is salutary. Sometimes, indeed, absolute repose is called for. Dr. Weir Mitchell, of Philadelphia, has happily restored invalids by a course of systematic rest; but in his cases this was a therapeutic, not an hygienic agency.

There are many morbid conditions in which severe exercise should be avoided, as in organic diseases of the heart; yet such valetudinarians are rather benefited than injured by moderate exercise.

Withal, there is no doubt that, in general terms, active exercise, in the open air preferably, is essential to the preservation of health and the prevention of disease. It tends to prevent, *inter alia*, dyspepsia and consumption, those two formidable enemies to human health and life. Its agency is more than preventive, for it is often curative also.

Section 2.—Influence of Occupation upon Longevity.

It is shown by many statistical observers that longevity is best promoted by labor in the open air. Practical farmers have the best average longevity; closely confined workmen the lowest.

Thus we find in one tabulated statement the following rates :

	Years.
1. Cultivators of the earth, average	61.89
2. Active mechanics in open air	50.42
3. Active mechanics in shops	47.61
4. Inactive mechanics in shops	41.64
5. Mechanics, trades not specified	44.44
6. Employed on the ocean	46.06
7. Laborers without trades	44.22
8. Teamsters, expressmen, etc	42.93
9. Professional men	48.11
10. Merchants, financiers, etc	47.34

The longest terms are allowed to farmers and mechanics in the open air ; the shortest to inactive mechanics in shops. Printers are, unfortunately, among the short-term men ; their (American) average is but 32.03, while in Great Britain, whatever may be the cause, their average is better, being 46.21. It would seem that being engaged in the "art preservative of all arts" is not preservative of the health of those who thereby earn their daily bread.

It would be easy to show, *in extenso*, how much better it would be for young men in selecting their pursuits to take more to agriculture and horticulture, to work in the open fields, than to seek occupation in the crowded cities. A respectable farmer, known to the writer, gave up his farm for an office to which he was unfortunately elected by the partiality of his fellow-citizens. The good farmer became a faithful officer, and no clerk under his supervision worked more closely at the desk than himself. Within two years he was taken with a disease that he had only known previously by name ; for, of course, he had heard of dyspepsia. In four years he was completely broken down. He retired from office, which he never should have accepted, too late for his own good, for he enjoyed good health no more during the remainder of his life.

Hard work, with inadequate compensation, is more com-

mon and more destructive in cities than in the country. It sends off hecatombs innumerable. It pretty nearly fills the cup of misery by privations, thus stated by Bouchardat, involving — 1. Privation of heat-producing aliments ; 2. Privation of heat-giving fuel ; 3. Privation of heat-saving clothes, as good woolen garments ; and, 4. Privation of warm and comfortable dwelling-houses.

We have seen so far but little in this country of excessive labor with remuneration insufficient for at least the necessaries of life. With the great resources of America, and the unoccupied soil inviting laborers to plant and enjoy the fruits of the earth without stint or hinderance, many generations ought to pass before America can know, but exceptionally, what has been but too well known among the masses in every country, and especially in every city, of Europe. Human overwork has not yet been naturalized among us. Its influences, with want, are thus summarily and pretty accurately stated by Dr. Richardson : "The majority of fatal diseases arising from overwork are now discovered. Give a human being overwork and deficient food, and he is the victim of diarrhœa and dysentery. Give him overwork and bad air and food, and he is the victim of consumption. Give him over mental work, with whatever air and food, and he is the victim of brain-disease and of one or the other of its sequences—insanity, paralysis, diabetes, premature death in any case ; death by suicide not unfrequently. Give him overwork purely physical, with air, with food, and the laboring heart, trying to keep up against its weariness, succumbs ; and so the overworked smith, boatman, or wood-heaver, falls suddenly, not more honored than the prize-fighter of to-day, or the fleet-slave and gladiator of a past and more barbarous age."

Section 3.—Limit to Labor.

It was Sir Robert Peel, we believe, who used to assert that no man failed in life who worked seven days in the week.

This may be taken as a valuable hint, but really the wisdom of the remark is more apparent than real. The mind and the body want rest, and moreover want, even need, recreation. Six days of labor and one day of rest are the terms allowed by the authority which decreed that man should forever earn his bread by the sweat of his brow. The French philosophers, in the days of their revolutionary triumph, substituted the tenth day for the seventh. It is said that the change acted unfavorably both on man and on the lower animals employed in his service. Thus it appears that the divine ordinances pertaining to labor are immutable.

Eight to ten hours a day given to labor of mind or body is quite as much as should be usually given; and then the seventh day must be given to rest.

The late Prof. Chew, in his instructive work on "Medical Education," tells of German students who devoted for life sixteen hours a day to study; and "how Budæus, through the whole of his life, up to the age of seventy-three, studied also sixteen hours every day, except the day of his marriage, when he was so annoyed and overpowered, as he said, by the womenkind, that, sad to relate, he accomplished only fourteen hours;" but we suspect that such profound scholars are half asleep during at least half the time of apparent study. Prof. Chew says he was called to advise a medical student, whom he questioned as to his habits of life. "He replied that he had been studying industriously all the session, and endeavoring to do his best; that he was constantly thinking of the final examination, and generally read twenty-six hours a day!" He saw amazement expressed in the professor's face, whereupon he explained: he did not read twenty-six hours in any one day, but he often read twenty-six hours "right ahead without stopping." The professor advised him straightway to abandon such extraordinary studies, fearing that, instead of going *ahead*, he would go *backward* in learning by such immoderate exertions.

Labor, moderate rational labor of mind or body, or both, conduces wonderfully to health and contentment. Artificial life has indeed imposed upon some men more than they can well bear, and from some it has taken the load altogether. Both extremes are deplorable. Industry gives force and vigor to life, and, within just limits and well regulated, it is among the prime essentials for the preservation of man's physical and mental and moral well-being.

CHAPTER VI.

THE FOOD OF MAN.—ACCESSORY FOOD.—MANNER OF EATING.—TEA AND COFFEE.

Section 1.—The Food of Man : Flesh.—Fish.—Bread.—Vegetables.—Fruits.

Man is sometimes called an omnivorous animal, as the animal, the vegetable, and the mineral world contribute habitually and directly to his sustenance.

It is generally conceded that man is designed to live on mixed food, that is, on animal and vegetable food ; both of these forms contributing at the same time a proportion of inorganic matter which is usually only supplied to the animal frame through vegetable matter.

Vegetables are intermediate between the animal kingdom and the inorganic world ; and, by chemical changes effected through their intervention, the inorganic is made subservient to the nutrition of the animal kingdom. "It is their function," says Carpenter, "to combine the oxygen, hydrogen, carbon, and nitrogen of the inorganic world into organic compounds, which not only serve as the materials of their own growth, but also as the food of animals whose existence is entirely dependent on them, since *they* possess no such combining power. It is from the water, carbonic acid, and ammonia, supplied by the atmosphere, and by the soil in which they are fixed, that plants derive these elements. On the other hand, the animal, making use of the ternary and quaternary compounds which have been elaborated by plants, is continually restoring their elements to the inorganic world in the very forms which they ori-

ginally possessed, for the excretion of water, carbonic acid, and ammonia, is constantly taking place in the animal body during life, as the result of those changes in which its peculiar activity consists. And thus is sustained that balance between animal and vegetable nutrition which is found to be the more wonderful and complete, the more carefully it is scrutinized."

The inorganic world, then, in general terms, supplies nutriment to the vegetable world, which in its turn yields nutriment to the animal world. Yet some animals derive their supplies only from other animals, in whom grass has literally become flesh. The green herb takes its food from the earth and the air; the lamb devours the herb, the lion devours the lamb. By a wonderful provision of Nature, all the elements of supply thus taken in by herb, lamb, or lion, are restored to the sources from which they were derived, to the earth and to the air, and thus the cycle of construction and dissolution continues in its revolving course unchanged through all ages. There is neither loss nor gain in the sum total of matter, which in itself is never exhausted nor worn out, nor renewed, its only changes being in place or form.

Some years ago the great chemist Liebig introduced a theory which divides all food into aliments containing nitrogen and aliments destitute of nitrogen. Those which contain nitrogen are considered alone capable of forming organized tissues. They are therefore designated as *plastic elements* of nutrition. Albumen, fibrin, and casein, are in this category. Those aliments which do not contain nitrogen are supposed to serve another purpose in the living economy: they do not form tissues, but they are inservient to respiration and the production of animal heat; hence they may be called *aliments of respiration*, or, otherwise, heat-making food. Oil and sugar are aliments of this kind. Liebig, then, divided foods into the azotized or nitrogenized on the one hand, and the non-azotized or non-nitrogenized

on the other—the nitrogenized food being plastic or tissue-forming, the non-nitrogenized being aplastic or heat-forming.

This theory was widely accepted for a time, and still has adherents, although known to be but partially tenable. Plastic forms of food become respiratory; and non-nitrogenized foods, or hydrocarbons, take a part in tissue-construction. There are some curious changes in the process of chylification. The chyle in the small chyliferous vessels contains a larger amount of fat which is non-nitrogenized than has been obviously taken in with the food; but as it passes onward the fat decreases proportionately, while there is an increase of the nitrogenized elements, so that the heat-making food becomes converted, without further appreciable accessions, into plastic or tissue-forming food.

Inorganic matters are usually contributed to the animal through the vegetable world, but they may be taken in more directly. A man does not take lime, for example, from the earth, as a plant does, but he may take it in lime-water, or in any water more or less impregnated with lime. His organism will suffer if he fails to get a sufficient quantity of this inorganic element. He takes habitually chloride of sodium, as an essential and not as an accidental ingredient in his food. The wild animals of woods and prairies seek this inorganic food at salt-licks or salt-springs.

We may derive *iron* directly from animal or vegetable food; or, if we do not, or get it in insufficient quantities, the deficiency may be made up by taking it in chalybeate waters or otherwise. Liebig says truly, "It s quite certain that, if iron be excluded from the food, organic life cannot be supported."

We take in oxygen from the air through the pulmonary cells, and its influence is felt immediately in vivifying the blood.

Many such instances may be adduced to show that animals may and do take inorganic elements into the system for

the purposes of nutrition independently of the aid of vegetables. Yet the general rule holds that animal life is supplied with inorganic matter principally through the intervention of vegetables which first derive and then transmit it.

There is one aliment which contains within itself all the essentials of food—water, nitrogenous matter, sugar, oil, phosphate of lime, and other salts. This aliment is MILK, in which, in the language of Dr. Prout, "we find a model of what an alimentary substance should be—a kind of prototype, as it were, of nutritious elements in general."

We see abundant evidence in Nature that milk does supply all that is necessary to animal existence, as all young mammals live upon it for a time exclusively. It will support adult life better than any other substance or element used alone. As a rule, the adult requires the addition of solid food. To this there are exceptions, not only with invalids but even with persons in full health. An African traveler asserts that the strongest man he ever knew scarcely ever touched animal flesh; he was a Dane, whose chief diet was thick sour milk, by the gallon, tea, and coffee.

"The proportions which the basic parts (of food) should bear to each other," says Dr. Richardson, "are taught us by Nature herself in milk. In that aliment, from its human source, the colloidal matter is present in the proportion of three, the combustible of six, the salts of one, and the water of ninety per cent."

"The solid constituents of food," says this author, "are represented to us in their purest and most natural form in corn, in which they exist as gluten (colloidal substance) for building, as starch for combustion, and as phosphatic salts for skeleton-food. The fluid menstruum is simply and naturally presented to us in pure water."

As bread and milk, or bread and butter, and water, contain all that is necessary for wholesome nutrition, parents may readily understand that it is the best combination of food they can allow to their little children. If these young

subjects were more nearly limited to such diet, and otherwise were governed by a few of the plainest laws of hygiene, we would no longer see half of the children born into the world carried off before the completion of the first decade of years.

We need not dwell longer upon the alimentary principles. It is understood that albuminous (colloidal), oleaginous, and saccharine elements are essential to animal nutrition, and that they must go together. No one suffices, nor do any two. Besides these, inorganic matters are required. Those which form necessary parts of the organism must be supplied, from whatever source derived. Thus lime, phosphorus, and iron, are necessary constituents of our animal frame. Chloride of sodium is indispensable. These elements are furnished, for the most part, in some of the ordinary forms of food. If deficient, the defect must be made up systematically. There is unfortunately some pains taken occasionally to remove wholesome materials from food. This happens when the phosphate of lime, which enters into the composition of wheat, is rejected by excessive refinement in making flour. The defect is compensated in some families by the use of cracked wheat, boiled, as an article of food.

We may now consider food in the various forms in which it is used by civilized man, and this is not the least among the important considerations of hygiene. Good health depends greatly upon it, and, if Galen was right, even good morals, for he believed that he could cure bad characters by the regulation of food. No doubt many could be benefited by the distribution of food, as, e. g., among our refractory aborigines, whose raids upon the stores of Western farmers and traders would be promptly brought to an end if an honest Galen were to furnish their rations

Meat, fish, bread, the ordinary vegetables, the accessories which are intended to make food more digestible or more

palatable, and various liquid ingesta, demand attention. The manner of preparing them for use, or cookery, will have some consideration.

Flesh-meat contains within itself a variety of alimentary substances or principles, as albumen, fibrin, syntonin, fat, gelatin, saline matters, and osmazome (or the various nitrogenized products from the process of cooking which have been called by that name), which gives flavor to cooked meats and soups. The nitrogenous parts go principally to the construction and repair of tissues, and also, as decomposed in the blood, take a part in the maintenance of animal heat, and influence the oxidation of other constituents. Fatty matters are more engaged in the maintenance of animal heat, while they contribute in a less degree to convert food into tissue. The oxidation of fat in the blood tends to give the force which is shown in all active movements.

Saline matters are important in the transference of organic constituents throughout the body.

Fresh meat is a great force-producer. In Playfair's "Dietaries of Well-fed Operatives," the English sailor has, as we are informed, 5 ounces of flesh-forming food, 2.57 ounces of fats, and 14.39 of starch and sugar daily, or 20.40 ounces of carbonaceous food, and 5 ounces of nitrogenous, or 25.40 ounces in all of solid food daily. Blacksmiths have 35.70 ounces daily, and prize-fighters, training, 20.50 ounces daily; but these last have, notwithstanding the restricted amount in the total, 9.80 ounces of flesh-formers, 3.10 ounces of fats, and 3.27 ounces of starch and sugar. More physical power is thus gained on a smaller amount of food when directed with a certain design.

Beef is estimated to contain 1,854 grains of carbon and 189 grains of nitrogen to the pound; mutton gives 1,900 grains of carbon, 189 grains of nitrogen; fat pork, 4,113 grains of carbon, 106 grains of nitrogen; dry bacon, 5,987 grains of carbon, 95 grains of nitrogen.

The carbon and nitrogen thus supplied to the organism are made available by combining with oxygen, whereby nutrition is principally accomplished.

Dr. Williams ("Principles of Medicine"), treating of food, says meat contains the albuminous, oily, and gelatinous principles, besides creatin and other soluble extractive matters, also probably nutritious. The object in keeping and cooking meat is to render it so tender that it may be easily softened by the gastric juice, and all processes which go beyond, or interfere with this result, render it less wholesome. Thus salting, pickling, hanging until it becomes tainted, and hardening by overcooking or fast boiling, which corrugates and toughens the fibre, are so many ways of spoiling meat for the purposes of digestion, and rendering much of its nutriment unavailable. The flesh of young adult animals presents the greatest amount of fibrinous material; that of younger animals contains more gelatin and fat; and that of very old ones is tough from the prevalence of more condensed fibrous textures, which, however, are converted into gelatin by boiling, and are therefore useful in the formation of soups. Different kinds of animal food vary very much in their composition, even when the lean parts only are selected. Thus beef and pork contain a large proportion of fat; mutton has somewhat less, and in the flesh of fowl, game, and white fish, there is only a very small amount. This affords an explanation of the fact that the latter articles make the best food for persons of weak stomach. The lean of veal contains very little fat, but it often disagrees. Veal well stewed with rice is less unwholesome than in other modes of cooking. Soups and broths, when deprived of excess of fat, are very useful articles of nourishment, used as auxiliaries to solid food, but they are insufficient for a working dietary.

Veal cooked with rice and flavored with curry proves to many persons both wholesome and grateful food.

Eggs may be considered with meat, their principal con-

stituents being albumen and oily matter. They also contain saline elements. As a general rule, eggs, when submitted for a short time to sufficient heat to coagulate their albumen slightly, are very wholesome and nutritious. The oil contained in the yolk sometimes disagrees with delicate stomachs.

According to Dr. Beaumont's researches, eggs are most readily digested when raw and whipped, disappearing from the stomach when thus prepared in an hour and thirty minutes, while hard-boiled and fried eggs require three hours and thirty minutes. Roasted eggs require two hours and fifteen minutes, and soft-boiled three hours, in the process of digestion.

Raw eggs have a laxative and cooked eggs a constipating tendency.

A reminder may here be inserted that, on inspection, fresh eggs are more transparent at the centre, and stale eggs more at the top. In a solution of one part of common salt to ten of water, good eggs sink, while those which are stale swim. In old eggs there is an air-space at the large end.

Beef and pork are generally suitable for strong stomachs and laborious life. The white meat of fowls, as of chicken, and fish, are better adapted to the uses of delicate persons, and those whose lives are not laborious.

No small part of the excellence of meat depends upon the cooking. Heat makes important changes in the meat, and prepares it to be readily acted on by the digestive organs. A great degree of cold also makes changes which render food more acceptable. People living in high latitudes, and arctic explorers, are very partial to frost-cooked food.

Boiling, roasting, broiling, baking, and frying, are the usual modes of cooking meat. The savory constituents of flesh are contained in its juices ; the fibre, in the natural state, being steeped in albuminous fluids, which are coagu-

lated by heat, by which process the contraction and hardening of the enveloped meat-fibres are prevented. According to Liebig, meat is underdone or bloody when it has been heated throughout only to the temperature of coagulating albumen, or 133° Fahr. ; and it is quite done, or cooked, when heated through its whole mass to between 150° and 165° Fahr.

There is an important matter in regard to the thorough cooking of meat which has only had full appreciation in the last few years. In the first place, meat in any way diseased or tainted is, if not quite safe, at least much less likely to injure the consumer, when well cooked. But, secondly, there are often parasites in the flesh of living animals—beef, mutton, pork, and even fish—which retain their vitality not only after slaughter, but also after imperfect cooking, and which, passing thus into the human stomach, are liable to produce not only dangerous but fatal diseases. A scientific acquaintance with these formidable parasites has been acquired by the use of the microscope. A practical acquaintance has been made with them through their fatal agency by consumers of raw or imperfectly cooked meat in many communities, especially in Germany. The *trichina* disease, the most common of this class, has been observed in all countries, the parasite *Trichina spiralis* often infesting pork. These parasites have, unfortunately, a great tenacity of life. Salting or other mode of curing meat does not destroy them, but thorough cooking does. Meats should be subject to scientific inspection when offered for sale ; and then and always, for prudential reasons, properly, that is thoroughly, cooked, before being consumed.

Roasting.—When meat is roasted the outer layer of albumen is coagulated, and thus all the contained juices are prevented from escaping. Roasting should be accomplished before a fire in full force, so that the investment of coagulated albumen shall be quickly accomplished before there is a chance for exudation of juices. If the juices escape, the

meat becomes proportionately dry, unsavory, and innutritious.

Baking.—Baking meat has a similar influence to roasting, but does not so well preserve the flavor.

Frying.—Frying is a coarse manner of preparing meat, which generally renders it difficult of digestion, besides impairing its nutritive qualities. In all cooking processes the fat of the meat is liquefied, but at a very high temperature the fat is changed into acid and acrid matters, which are irritant to the stomach, and little fit for digestion and assimilation. Frying, then, is, for the most part, an objectionable form of cookery.

Broiling.—Broiling is a form of roasting, and, when done quickly and properly, is an excellent manner of preparing meat for the digestive organs.

Boiling.—Boiling affects meat according to the process adopted. If the joint be placed in water actually boiling, the albumen of the surface is coagulated, and the inner part of the meat is cooked by a steaming process. All the juices are thus preserved. If the flesh be introduced into the boiler, according to Liebig, when the water is in a state of brisk ebullition, and if the boiling be kept up for a few minutes, and the pot then put in a warm place, so that the temperature of the water is kept up at 158° to 165° Fahr., we have the united conditions for giving to the flesh the qualities which best fit it for being eaten.

But if meat be placed in cold water, which is then to be boiled, its condition is quite changed. As no albuminous investment is coagulated over the surface, the nutritive juices escape from the flesh into the water, so that the meat is impoverished, and its fibres become tough and hard. This is illustrated in the preparation of soup. Soup-meat, or *bouilli*, is remarkably poor and innutritious.

If the object is, however, to get the nutritious quality of the meat in the form of *soup*, the meat, cut in small slices, may be slowly boiled so that its juices may be ex-

tracted and taken up by the water. The water may be slowly and gradually heated to the boiling-point, at which it may be maintained for a few minutes ; the meat may then be strained and pressed, so that nearly all its nutritive qualities will be yielded to the soup.

Beef-tea, as it is called, and the *extract of beef*, are much in use with invalids, and every housekeeper should know how to prepare them.

Beef-tea is a delicate soup. It may be made by the following process : Take of lean beef, cut up into small pieces, one pound, water one quart. Boil for twenty minutes, constantly removing the scum as it rises to the surface. Strain when cold. Salt or spices may be added according to circumstances. Or it may be prepared more eligibly by adding one pound of lean beef, cut in small fragments, to a pint of cold water, in a covered vessel. Place the vessel near the fire for about two hours, so that the water becomes slowly heated ; at the end of two hours, boil for half an hour, strain, and flavor to suit the taste.

There are various methods of preparing beef in extracts or essences for invalids, but these have been greatly superseded, of late years, by ready-made preparations, such as Liebig's "Extract" and Valentine's "Meat-Juice," Johnson's and other forms, which have the advantages of being always ready for use, of convenience, and of uniformity.

Liebig's broth is a good preparation, made as follows : For one portion of broth take half a pound of freshly-killed meat (beef or chicken), cut it into small pieces, and add to it one and an eighth pound of pure water, to which have been added four drops of muriatic acid and thirty to sixty grains of common salt ; mix them well together. After standing an hour, strain the whole through a conical hair-sieve, allowing it to pass through without pressing or squeezing. The portion passing through first being cloudy, it is again to be poured through the sieve, and this process repeated until it becomes perfectly clear. Upon the residue of meat remain-

ing in the sieve pour half a pound of pure water in small portions. In this manner about one pound of liquid extract of meat is obtained, of a red color, and of a pleasant, meat-broth taste. It is administered to the sick cold, by the cupful, according to their inclination. It must not be heated, as it becomes cloudy thereby, and a thick coagulum of meat-albumen and hæmatin is deposited.

As young housekeepers do not know how to select meat, we will present a few hints here, as furnished by Dr. George Wilson :

1. Good meat should present a marbled appearance, from intermixture of streaks of fat with muscle. This shows that the animal has been well fed.

2. The color of the muscle should neither be too pale nor too dark. If pale and moist, it indicates that the animal was young or diseased ; and if dark or livid, it shows that in all probability the animal was not slaughtered, but died with the blood in it.

3. Both muscle and fat should be firm to the touch, not moist or sodden, and the latter should be free from hæmorrhagic points.

4. Any juice exuding from the meat should be small in quantity, of a reddish tint, and give a distinctly acid reaction to test-paper. Good meat should dry on the surface after standing a day or two. The juice of bad meat is alkaline or neutral.

5. The muscular fasciculi should not be large and coarse, nor should there be any mucilaginous or purulent-looking fluid to be detected in the intermuscular cellular tissue.

6. The odor should be slight, and not by any means disagreeable. An unpleasant odor indicates commencing putrefactive change, or that the meat is diseased. By chopping a portion of the meat into small pieces, and afterward drenching it with warm water, any unpleasantness of odor will be more readily detected. Another good plan is to

thrust a long, clean knife into the flesh, and to smell it after withdrawal.

Brain, liver, etc., should be carefully inspected.

Bad meat is usually sodden and flabby, with the fat dirty or gelatinous looking, and the smell unpleasant or sickly.

Sausages, with a bad smell or nauseous taste, an acid reaction, or a soft interior consistence, are very dangerous, and quite capable of poisoning the consumers.

Fish.—Fish, for the most part, forms light and nutritious food, easy of digestion, though less nutritious than meat. There are some ideas prevalent in regard to fish as food which may receive a passing notice. Fish-eating people (*ichthyophagi*) are said to be more prolific than others; and fish-eaters are supposed to derive from that food a quantity of phosphorus which is taken up by the brain and nervous system, and thereby to obtain a degree of intellectual superiority. These views are not supported by any established facts.

Some fishes are directly poisonous, but they are found mostly in the tropics, and need not be considered here. The fishes brought to our markets are usually safe and wholesome when in good condition, and at proper seasons. Some fishes, as eels, are very oily, while others are comparatively free from oil, as the rock-fish; and, in regard to eating those which belong to one or the other category, the individual must decide for himself which agrees or disagrees with his own stomach.

Fish should be consumed while fresh, as they soon undergo putrefactive changes when kept. This change may be prevented by salting, but salting impairs their nutritious properties. Of all solid food, white fish seems to give least carbon (carbon 871, nitrogen 195), while red herrings give 1,435 grains per pound of carbon, and 217 grains of nitrogen.

Oysters are wholesome and nutritious. When raw,

broiled, roasted, or stewed, they are usually easy of digestion; when fried, they are apt to disagree with delicate stomachs. To be wholesome, they should be consumed when quite fresh. They cast their spawn in May or June, after which they remain for a time in bad condition and unfit for use. It is popularly said that they ought not to be eaten during any month that has not an *r* in it. It were better said, from Maryland and Virginia southward, that they should not be eaten from the early part of April to the latter part of October. The writer has attended many cases of a choleraic character in persons who had eaten oysters before the recurrence of autumnal frosts, even in October. He has seen all the gastro-enteric and nervous symptoms, called among the Spanish peoples of the West Indies by the name of *siguatera*, to designate a disease following the consumption of poisonous fishes, induced by eating oysters unseasonably. What has been said of oysters applies equally to lobsters and crabs. These marine luxuries all change readily, and, if eaten out of season, or not perfectly fresh, are liable to cause enteric disease, cholera-morbus, or *siguatera*.

In calling any food wholesome or unwholesome, it may be remarked, once for all, that such expressions are of general but not of universal application. "What is one man's meat is another man's poison," by exceptions to the general law. Every man is bound to gain in these matters some personal experience. It was a remark of Van Swieten's that "to assert a thing to be wholesome, without a knowledge of the condition of the person for whom it is intended, is like a sailor pronouncing the wind to be fair, without knowing to what port the vessel is bound."

Bread.—This article of food, which now claims our attention, has been justly designated "the staff of life." In this country our bread is made of wheat, Indian-corn, or rye. Wheat is composed of starch, of gluten, which has many of the properties of animal matter, of a mucilaginous

saccharine substance, of gum, and a notable proportion of mineral constituents, as potash, magnesia, soda, lime, with phosphoric acid, and other acids in combination. *Gluten* is the body which gives tenacity to dough and bread. "It seems," says Attfield, "to be a mixture of vegetable fibrin, vegetable casein, and an albuminous matter termed glutin. These substances and gluten itself are closely allied; each contains about sixteen per cent. of nitrogen. *Wheaten flour* contains about seventy-two per cent. of starch and eleven of gluten, as well as sugar, gum, fine bran, water, and ash."

These elements should all be preserved in the flour in something near their natural proportions. They are all needed for purposes of healthy nutrition.

The finest grades of flour now in use, as *family flour*, have an excess of starch, with defect in the proportion of gluten and phosphates. The defect is supplemented in many families by the use of cracked wheat, hominy, oatmeal, etc. This last is particularly rich in albuminoid or flesh-forming constituents, containing nearly sixteen per cent.

Light or fermented bread is made of flour, water, yeast, and salt, which are formed into a batter, and subjected for some hours to a moderate heat. Certain chemical changes occur; among others the yeast sets up an active fermentation, by which the sugar of the flour is converted into alcohol that escapes in the form of gas, and into carbonic acid. This carbonic acid, being diffused through the mass, becomes entangled by the tenacious gluten of the dough, and it is this retention of the gas that gives to bread its lightness and sponginess. When the dough is subjected to further heat in baking, the carbonic acid expands, and fills the loaf with vesicles, or eyes, as they are often called. The more perfect this process, the better the bread. By virtue of the spongy texture of the bread, the morsels as eaten are brought more readily in contact with the gastric juices. When bread is deficient in this sponginess, it is said to be heavy, and it is then very difficult of digestion.

Bread should be thoroughly baked, and it is in best condition for mastication and digestion when not warm, or unduly fresh. When recently taken from the oven, the vesicular structure is easily destroyed, as one may observe by crushing it in the hands. The same occurs in chewing it, so that hot or fresh bread is much more liable to form a heavy and indigestible mass in the stomach than bread in which a moderate desiccation has made the vesicular structure more permanent.

Flour is apt to deteriorate by long keeping, principally on account of absorption of moisture from the air. It should be kept perfectly dry, otherwise a chemical change occurs resulting in a change of a portion of the flour into dextrin and gum, so that the bread made from it is heavy and sodden. According to Liebig, the addition of a portion of lime-water to the dough, in making bread of such flour, tends greatly to restore its normal condition. In Europe, ground bone-dust sometimes enters into the composition of bread for the purpose of enriching it with inorganic ingredients.

Alum, sulphate of copper, and other chemicals, are added to bread by some bakers for special purposes—not for the improvement of the bread, however. Alum makes the bread whiter, and enables it to hold additional water in its composition. In bread properly made, one hundred pounds of flour give one hundred and thirty-six pounds of bread. All bread should be light, sweet, porous, and not too fresh when used. It should not be sour nor heavy. Sometimes a stale loaf, somewhat sour, may be improved by slicing and toasting, the heat in this process driving off the acid element.

Unfermented bread is that which is made without the use of yeast or leaven, or other ferment. Crackers and Maryland biscuit, so largely consumed in the Southern States, are unleavened. This kind of bread agrees best with some stomachs, but, in health, it is generally a mere matter of taste between leavened and unleavened bread.

Corn-meal makes a strong, nutritious bread, rich in oil, but composed nearly entirely of starch, with little nitrogenous matter.

Rye-flour also makes a strong, nutritious bread, but it is rather heavy for a delicate stomach. A very good *brown bread* may be made of mixed wheat and rye flour. As the starch in wheat-flour tends to constipate, the coarser rye-flour obviates this tendency.

No small part of the satisfaction or disaffection in life depends upon the quality of the bread in use.

Vegetables.—We may pass briefly over the forms of vegetable food in common use. Dr. Beaumont tested the digestibility of a large number of them with his remarkable patient, St. Martin. Some of the results may seem a little curious. Thus, cabbage-head, *raw*, required two hours and thirty minutes for digestion; the same with vinegar two hours; while boiled cabbage required four hours and thirty minutes. Rice was digested (boiled) in one hour; Irish potatoes (boiled) in three hours and thirty minutes. Potatoes and rice abound in starch. Beans and peas are farinaceous vegetables. They contain starch, oil, and a nitrogenous matter sometimes called vegetable casein. They are very nutritious, but not always easy of digestion. When young and tender, they rarely disagree; when old, they can only be made fit for food by very prolonged boiling.

Cabbage is rich in albumen, and is, for the most part, a wholesome article of food. It often disagrees, however, with delicate stomachs, causing distressing flatulence. Many persons can eat cold-slaw or sauerkraut with safety, who cannot take cabbage in other forms.

Tomatoes generally agree well with a healthy stomach. They are more refreshing than nutritious. Of *cucumbers*, which are usually eaten raw, Dr. Paris observes, "They are by far the most unwholesome of all raw vegetables, and should be avoided as poison by dyspeptics." Raw cucumbers should not be eaten freely; but a few slices, nicely prepared,

may by most persons be eaten at breakfast as a salad, or for giving, not for allaying, appetite. *Turnips* sometimes cause flatulence, but generally the healthy stomach digests them very well. *Parsnips* are nutritious and digestible. *Onions* are nutritious and stimulating, but are differently received by different stomachs. With some they always disagree. With others they are always acceptable. Dr. Paris says that onions appear to form the connecting link between alimentary roots and those used principally as condiments. They contain stimulating matter and withal a considerable amount of nutritive material. When thoroughly boiled, the acrimony is driven off, and a sweet mucilage remains. The French consider *soupe à l'oignon* as one of the best of restoratives.

Fruits.—There can be no general rule as to the wholesomeness of fruits. Those in common use among us, as apples, pears, peaches, and grapes, are usually wholesome when ripe and in good condition. They are not always safe, however, with the invalid. Every physician has occasion to observe the ill-effects which often result to invalids from eating apples, for example, especially those kept for winter use. Catarrhal affections are often aggravated by the ingestion of uncooked apples, which persons affected sometimes take for remedial purposes, under bad advice.

Fruits eaten after meals are apt to disagree. When taken with milk or cream, the probability of disturbance of the digestive function is increased. So far, however, as additional food to a sufficient dinner may be concerned, nearly all things taken by way of dessert are objectionable. In other words, when the wants of nature are satisfied, a rational being should not continue to add food, which, in any form, must be redundant, if not in its very nature pernicious. Desserts should never be eaten except as a *part* of the dinner ; that is, they should not be superadded to a meal which is already sufficient. The *quality* of the dessert

is sometimes blamed where the real fault is in the *excessive quantity* of the food.

Many fruits are safe when freshly gathered, which soon become unsafe in the market-house. Thus cherries when eaten from the trees are much safer than when taken from the hucksters' stores.

Section 2.—Accessory Food: Condiments.—Butter.—Oil.

Condiments are sometimes significantly called *appetizers.* Hard work and attendant good appetite require little else than common salt as a condiment, which should be plentifully used. It was said by Plutarch that *hunger* and *salt* were the only sauces known to the ancients; and the very word "sauce" is derived from the Latin word *salsus*—"salted." In former times the laws of Holland required prisoners to be kept on bread alone, *without salt*, as the severest punishment that could be inflicted on them in that moist climate. The result was horrible: the wretched criminals are said to have been devoured by worms engendered in their own stomachs.

Vinegar and *lemon-juice* are often used to promote digestion, and indeed such acids seem necessary in the absence of acidulous fruits and vegetables. In moderate quantities, with most persons, their influence is to promote digestion; used in excess they impair digestion and cause emaciation. Instances are known of the profuse use of vinegar to reduce excess of fat in young ladies, with, as a result, reduction of fat indeed, but, moreover, emaciation and permanent loss of health.

Pickles of good quality may be used with discretion. They certainly disagree with some individuals, who therefore denounce them; but, nevertheless, they are not to be rejected from table-use because some persons find them objectionable.

Aromatic Condiments.—Pepper, ginger, mustard, and

horseradish, are important accessory foods. Wholesome, well-cooked food, on the one hand, and a good stomach, on the other, may well dispense with these accessories. They sometimes cause the consumption of more food than nature requires (in health), and then their use is injurious. But in the semi-invalid world with which we have to deal, there are many stomachs with defective innervation and secretions which are benefited by spices. The writer has found, on shipboard, no condiment equal to capscium, or red pepper, dashed upon soup, when going distrustfully to the table with a heavy sea on.

Butter and *oil* belong to the oleaginous condiments. When sweet, they are eminently wholesome and nutritious; when rancid, they cause indigestion. *Melted butter* is objectionable, from the fact that heat causes a new development of fatty acids, which are irritant and indigestible. Buttered toast, sometimes given to invalids in the form of toast saturated with melted butter, is eminently objectionable.

Olive-oil, used with us principally for dressing salads, is for most persons a very wholesome article of diet.

It may be remembered that all oleaginous foods have some of the valuable properties attributed, and justly, to cod-liver oil. Wherever they can be duly and properly assimilated, they are capable of exerting hygienic, prophylactic, and curative influences.

Section 3.—Manner of eating.

Food should be taken at regular intervals, in moderate quantities, and it should be eaten slowly. Eating in haste is a great cause of dyspepsia. Food to be well digested should be thoroughly masticated and well mixed with the salivary secretion, as the beginning of the digestive act. The rapid eater allows no time for the necessary changes to be accomplished in the mouth; and, moreover, he eats habitually much more food than is either necessary or

wholesome. This rapid eating or bolting of food has tended to make Americans a dyspeptic people. In the economy of health it is much wiser to give a little more time to eating than to eat more in less time ; and, moreover, it would make men happier and more contented with their condition in life, for nothing spoils the temper more than bad digestion. "Remember, Sancho," said an errant philosopher, "that the stomach is the laboratory in which the health of the whole body is tempered, and therefore do not overload it, but treat it with becoming discretion."

Learned hygeists and physiologists agree with this sentiment, only expressing it in more professional language. "It appears," says Dr. Tilt, "that each separate ganglion sends its contingent of nervous force to the central ganglia, which reacts on the brain, and that the force with which the ganglionic nervous system is endowed is as much centralized in the epigastric region as the intellectual faculties are in the brain. Discordant as medical theories generally are, it is singular how often the importance of considering vital force as centralized in the epigastric region has been prominently asserted. Galen and Fernellius called it the principal lever of the human forces ; Van Helmont there placed his Archeus, or principal ruling power ; Wrisberg and Lobstein treated it as the *cerebrum abdominale ;* Hunter called it the sensitive centre, and the centre of sympathies ; and Bichat, Broussais, etc., considered it the prime conductor of nervous influence."

It has been said that the best promoter of digestion is a contented mind ; and, on the other hand, it may be equally well said that the rule acts in both ways. Haller called the stomach the "conscience of the body," and this conscience ought to be respected, instead of being wronged as it is habitually.

Tea and Coffee.—The views in regard to these popular beverages are very contradictory, even among medical men. The simplest statement of the facts is, that one or both

are safe and wholesome for the great majority of adults, provided they are used in moderation. Children should be discouraged from their use; or, if it be allowed, they should be largely diluted with milk. *Thein* and *caffein* are organic bases in tea and coffee respectively, and both are potent nervines. It may be assumed as a fact that all such agents are readily capable of acting injuriously on the nervous system, if not used within the limits of discretion. Many persons are dyspeptic from the use of the one or the other of them. Tea is constipating, coffee is not. Both are capable of inducing insomnia, and various nervous as well as gastric disturbances. Careless housekeepers often spoil tea by making it *strong*, which often means nothing more nor less than driving off the grateful and refreshing *aroma*, which is exactly what ought to be preserved, and drawing all the astringency from the leaves, which makes an infusion that could as well be derived from oak-bark or gall-nuts.

Dr. Chambers, in his work on "The Indigestions," says, "Much ill-health arises among women of the lower orders in this country from the custom of sluicing themselves with tea." It may be so in England, but some of the bad effects are attributable to the causes that induce these women to indulge so largely in that form of stimulant.

Briefly, tea and coffee are among the luxuries now become necessaries in general society; they greatly promote the comfort of life; and they only injure in exceptional cases, or from excessive use.

"The ultimate destiny of food," says Dr. Wilson, "is the development of heat, and other modes of motion, which together constitute the physiological phenomena of animal life. The potential energy with which the food is stored becomes converted into actual or dynamic energy, and is manifested in the body as heat, constructive power, nervo-muscular action, mechanical motion, and the like. But, as food also supplies the materials which are requisite for the

development and maintenance of the living fabric, as well as for the display of its various kinds of active energy, it may be inferred that inorganic and organic substances are both necessary. The organic alone are oxidizable, or capable of generating force, while the inorganic, though not oxidizable, are essential to the metamorphosis of organic matter which takes place in the animal economy."

We have now passed in review many of the most important constituents of food, from whatever source derived, and will make but little general commentary. As a fact of common observation, most persons in the prosperous classes consume too much food. Food must be proportioned to work, and, if the relations be not preserved, the consumer will inevitably suffer. Excessive food engenders dyspepsia ; dyspepsia, not considered immediately dangerous to life, certainly predisposes to many secondary maladies which ruin the health, with or without inducing a prematurely fatal issue. Haller's *conscience of the body* always warns a man when nature has a sufficient supply ; if he habitually disregards this conscientious warning, he will in some form surely pay the penalty.

All Nature furnishes food as it furnishes consumers, from omnivorous man to the lowly chlorophyl body, which and which alone feeds upon an exclusively mineral diet. How immense, how wonderful, how unspeakable, the distance between the highest and the lowest of all that lives visibly upon the face of the earth ! And there are consumers for detrimental matters floating about us which neither the eye of man unaided, nor assisted with his mystery-searching microscopes, has ever scanned. There are organisms associated with the decomposition and decay of organic matter, " saprophytes," as Dr. Roberts calls them, " whose special function in the order of Nature is to destroy, not create, organic matter ; and they constitute not the first but the last link in the biological chain. For, if we regard the order of life as it now proceeds on the earth's

surface, we may describe it as beginning with the chlorophyl body and ending with the saprophyte."—(*See* address on "State Medicine," by Prof. J. L. Cabell, M. D., *Sanitarian*, August, 1878.)

From the chlorophyl to man, and from man to the saprophyte, what an all-devouring world is this in which we live, and move, and have our (temporal) being !

CHAPTER VII.

ALCOHOL—USE AND ABUSE.—ARDENT SPIRITS.—WINES. —MALT-LIQUORS.

"Doctors will differ."

We will not make it a question whether alcohol is a remedy for disease, or for some kinds of disease, for it may be assumed that all the world, medical and non-medical, agrees that alcohol, in some form, is remedial in some diseases, or in some conditions of disease. Like a potent agent, and a kindred one, opium, it has its uses, and is liable, too, to great abuse.

The best of medical lexicographers (Dunglison) says alcohol is an "Arabic word formerly used for an impalpable powder, and signifying 'very subtile, much divided.'" It is, then, a most expressive term. The same authority goes on to say that "alcohol acts on the animal body as a powerful stimulus: as such, it is used in the prevention and cure of disease. Its habitual and inordinate use is the cause of many serious affections of a chronic character, especially as visceral obstructions, dropsy, etc."

It is the intoxicating principle of all spirituous liquors; and there seems to be some property in it of intoxicating, or at least of disturbing the mental equilibrium of all who touch, taste, smell it, or write or talk about it. Subtile and subtle it is in itself, or in those whom it inspires in attack or defense. Although nameless in past ages, it is the *spirit of wine* which has been the subject of eulogy or of condemnation from the time when it overcame a venerable patri-

arch, who, perhaps with some good reason, had grown tired of "cold water," down to the present day.

We will endeavor to treat the subject upon its own merits or demerits. Alcohol is a stimulant in small doses, a narcotic in large doses. Dr. Anstie, with great cleverness, drew a line between the stimulation and depression, or narcotism, which may arise from the use of any one of a large number of agents classed by medical authorities under the general term of *narcotics*, or agents capable of producing narcosis or stupor. Alcohol is eminently capable of stimulating slightly, of stimulating greatly, and of exceeding the bounds of stimulation altogether. When a poor unfortunate is so besotted with strong drink as to have no intelligence nor volition, or when these are very greatly impaired, he is said to have taken too much stimulus, but, in point of fact, he is not then stimulated, but in the very reverse condition. The stimulus of a glass of wine is a very different thing from the stupor induced by a large potation of whiskey. The latter has acted as a true poison; and, when the man is intoxicated, he is literally and truly poisoned. Between "a little wine" and a heavy draught of whiskey or brandy, or other ardent spirit, there is a "poison-line" that may not be passed by any one with impunity.

Temperance advocates are pleased to speak of alcohol always as a poison, but this is overstraining the facts of the case. A nice definition of poison, subject to no objections, is difficult, if not impossible; but it may be said that some, nay, many agents act as poisons or not according to quantity, method of administration, and conditions under which administered. Under no ordinary circumstances (exceptions allowed for) would the alcohol in a tumblerful of claret exert the deleterious influences characteristic of poisons, while exactly under ordinary circumstances a tumblerful of alcohol would be poisonous and probably fatal to the consumer. Innumerable agents in common use may be spoken of in the same way. Common salt (chloride of so-

dium) is absolutely necessary as a condiment ; is it also a poison ? In ordinary domestic use, certainly not, but in large quantities it is sufficiently irritant to cause inflammation, or even death, if not rejected from the stomach. A pound of it taken in a pint of ale caused death in an instance recorded by Dr. Christison, with all the symptoms of irritant poisoning. The stomach and intestines were found excessively inflamed.

While a half-pint of alcohol would endanger the life of a temperate man in good health, there are conditions of disease in which, more or less diluted, it may be the means of saving life. The poison-line, as Dr. Anstie says, is liable to be changed by many conditional circumstances, not only with alcohol, but with other narcotic agents, as opium. Every physician has to double, treble, or quadruple his doses of opium in some cases, and he sees, instead of the usual narcotism, only a reviving or stimulating effect upon the nervous system of the sufferer. And so with alcohol. It may happen that delirium and convulsions will follow any great hæmorrhage. In such cases even delicate women, entirely unaccustomed to its use, have been revived and saved by the timely use of brandy or other spirit, which gives power to the flagging heart, feeds the nervous centres, and arrests convulsions.

Under such circumstances brandy deserves the name of *eau-de-vie*, which it has borne for ages—indeed, from the twelfth century to the present time. Surely it ought not to be classed in the same category with *aqua Tofana*.

Ardent spirits are then poisons, or not, according to the use that is made of them. They may destroy the life of one man, and save the life of another.

There can be no reasonable question as to their being valuable therapeutic agents when properly applied. And it is to be feared that they have been greatly misapplied, or abused when intended to be remedial, of late years, in medical practice. The same may be said, indeed, of opium,

and of all potential remedies, for, as a rule, whatever is potent for good is potent for evil also, if misused.

We do not propose, however, to discuss therapeutics. The question here is, not what alcohol may do for people under medical treatment, but what may be its influence with those who are in good health. Alcohol is poison; alcohol is food. Many will deny one or other part of this double proposition, but it is, or it may be, true. It is poison in poisonous doses, which may be different with different individuals. It is food, inasmuch as it is capable of digestion, of assimilation, and of nourishing the living organism. Dr. Richardson does not admit of any use for alcohol, in any of its forms, as a necessity of life. The physician, "beyond the sphere of its value as a drug which he may at times prescribe, sees nothing but a void; in whatever way he turns his attention to determine the persistent effects of alcohol, he sees nothing but disease and death: mental disease, mental death: physical disease, physical death."

It is little matter as to the manner of its combination. "It is as alcohol in its pure form, as the ardent spirit of the old writers, the ethylic alcohol of modern chemists, and the basis of all our common intoxicating drinks, that it is best studied. To say this man drinks only ale, that man only drinks wine, while a third drinks spirits, is merely to say, when the apology is unclothed, that all drink the same danger."

This distinguished investigator says he has "found by direct research that the proportion of thirty grains of alcohol to the pound weight of the animal body is the quantity capable of producing intoxication, while an increase of this amount to sixty grains is productive of immediate danger." —("Diseases of Modern Life.")

It would be well for any thoughtful man who doubts whether or not he is in danger from the use of this subtile agent to read the chapters bearing directly thereupon in

the work just quoted. In this work disease is not considered, but under the title of "Phenomena of Disease from Alcohol—The Functional Type," Dr. Richardson devotes sections to the following subjects: 1. Alcoholic dyspepsia; 2. Sensory disturbances from alcohol; 3. Vascular changes in the skin; 4. Alcoholic thirst; 5. Symptoms of systemic failure. Under "Organic Disease from Alcohol" are found the following significant sections: 1. Disease of the heart; 2. Disease of the blood-vessels; 3. Disease of lungs from alcohol: alcoholic phthisis; 4. Disease of the liver from alcohol: diabetes; 5. Disease of the kidney from alcohol: calculus; 6. Disease of the eye from alcohol: cataract; 7. Alcoholic insomnia or sleeplessness; 8. Nervous diseases from alcohol; 9. Epilepsy from alcohol; 10. Paralysis from alcohol; 11. Mental alienations from alcohol: dypsomania, *mania a potu;* 12. Delirium tremens; 13. Hereditary transmission of alcoholic disease.

The very terms are appalling. Alcohol is quite capable of damaging each and every organ and tissue of the human body; and, furthermore, its victim transmits mental and physical disease, or strong tendencies thereto, to succeeding generations. What offsets may there be to the fearful dangers arising from its misuse? Dr. Richardson speaks as follows: "It will be said that alcohol cheers the weary, and that to take a little wine for the stomach's sake is one of those lessons that come from the deep recesses of human nature. I am not so obstinate as to deny this argument. There are times in the life of man when the heart is oppressed, when the resistance to its motion is excessive, and when blood flows languidly to the centres of life, nervous and muscular. In these moments alcohol cheers. It lets loose the heart from its oppression; it lets flow a brisker current of blood into the failing organs; it aids nutritive changes, and altogether is of temporary service to man. So far alcohol may be good, and if its use could be limited to this one action, this one purpose, it would be among the

most excellent of the gifts of science to mankind. Unhappily, the border-line between this use and the abuse of it, the temptation to extend beyond the use, the habit to apply the use when it is not wanted, as readily as when it is wanted, overbalance, in the multitude of men, the temporary value that attaches truly to alcohol as a physiological agent. Hence alcohol becomes a dangerous instrument even in the hands of the strong and the wise, a murderous instrument in the hands of the foolish and weak. Used too frequently, used too excessively, this agent, which in moderation cheers the failing body, relaxes its vessels too extremely, spoils vital organs, makes the course of the circulation slow, imperfect, irregular ; suggests the call for more stimulation, tempts to renewal of the evil, and ruins the mechanism of the healthy animal before its time for ruin, by natural decay, should be at all near."

These are the words of a very sagacious physician, as well as of a medical philosopher, and they merit close attention.

Dr. Richardson is in fact a strong advocate of total abstinence, as a thing in itself always safe and prudent while any indulgence in wine or liquors is at best useless and always dangerous.

We must say frankly that many eminent physicians are less rigid in their views, though all agree as to the potentialities in alcohol for evil.

Hufeland expresses himself as follows : "Nature herself has provided for us that most excellent spirit, *wine*, which excels all those prepared by the art of man. If there be anything in the world which one may call the *prima materia*, that contains the spirit of the earth in an incorporated form, it is certainly this noble production ; and yet we find," he adds, with characteristic caution, "that too liberal a use of it occasions a speedier consumption, brings on old age, and evidently shortens the duration of life."

Dr. Fothergill sustains the idea that alcohol is food. "It is a food," he says, "as well as a stimulant. In fact, it

is one of the most easily assimilable forms of food, and very frequently it can be taken and utilized when no other form of food is available. While it is a stimulant, an evoker of force, it also supplies, to some extent, that force in its readily oxidizable self. The recent experiments of Dr. Anstie and Dr. Dupré have placed beyond all question or honest doubt the fact of the oxidation of alcohol within the organism. If alcohol is oxidized in the body, then alcohol is a true food, or furnisher of force."

It should only be considered a food, however, for those who are ill, or, for some reason, ill nourished.

Further on he says alcohol is very useful in convalescence; a glass of wine and a biscuit may be taken between meals, to be gradually abated, so that at length it is to be limited to meal-times in the form of sound malt-liquor or some generous wine. "But as a rule there should be no other consumption of alcohol, except it be at bedtime, when it may be taken for its direct hypnotic qualities." The limited use here prescribed is really therapeutic. If the convalescent exceeds careful directions, "it may turn out to have been a most unfortunate thing for the patient that the illness was survived."

Here is no language of prejudice. Alcohol is food—alcohol is a reviving agent; but its use must be under watchful limitations.

Some years ago, Dr. Bouchardat held conferences with the working-men of the Polytechnic Association of Paris, on the abuse of alcoholic liquors, and his views substantiate those of the most reliable of American and British physicians. As the result of the most careful consideration, he declares his conviction that the abuse of alcohol is now the greatest obstacle to the advancement of the common interests of humanity. It is destructive to ease of condition and to good morals, and, as he says with profound truth, *L'aisance et les bonnes mœurs sont les meilleurs auxiliaires de l'hygiène.*"

"Do alcoholic liquors give strength, as is generally believed?" he asks. Apparently, not really. Alcohol excites the nervous system, whence results an apparent and temporary exaltation; but, if this is not utilized, there is collapse, with a real diminution or depression of vital force.

Good alcoholic liquors offer incontestable advantages for convalescents exhausted by disease, or the workman worn down with labor; but we must add, he says, excess is always injurious.

The reader, we hope, will bear with some extracts, translated from these well-considered conferences.

Wine is said to be milk for the aged—*le lait du vieillard*—but let us have a clear understanding upon this matter. In a vigorous (*verte*) old age, alcohol should be used very sparingly; but in decrepit age, when solid food cannot be well digested, wine becomes eminently appropriate and useful.

Of fermented drinks, wine is the most important, the most useful, and the least injurious in many respects, even when taken in excess.

Wine is very composite, containing within itself not only water and alcohol, but ethers, essential oils, sugars, tannin, potash, soda, lime, magnesia, alum, iron, ammonia, and various acids which are more or less free, or in excess over the salines with which they are combined.

The proportion of alcohol in pure French wines varies from five to fifteen per cent.

As a nutritive agent it must not be forgotten that, with the absorption of the alcohol, acids and other matters are taken up which modify the influence of the alcohol and its action upon the nervous system.

The tannin and the coloring-matters have sometimes a favorable influence upon the stomach: the *bouquet*, which is so grateful to the senses of taste and smell, has hygienic uses, for it is well known that many sapid matters, even in

very small quantities, exercise a favorable influence upon nutrition.

Wine is absorbed less rapidly than ardent spirits, and alcohol in equal quantities in red wine and in brandy disturbs the nervous system to a less degree in the wine.

The various inorganic materials which enter into the composition of wine introduced into the human organism, when in the condition to require them, may explain the restorative action of wine with persons suffering for adequate alimentation.

Wine is not suitable for children ; it may be useful to the adult working-man, and to the man advancing in age, though only in small quantities. The working-man who uses wine as an auxiliary to solid food should only take it at his repast, with his family. Bouchardat gives an instance of two war-vessels serving together, one French and the other English, where supplies were scarce. The crews had generally about the same food, but spirit was served to the Englishmen and wine to the Frenchmen. The former had scurvy, the latter escaped it.

Abuse of Wine.—This tends to the same evils as the abuse of ardent spirits, though in a less degree. It is better borne with a life of physical industry than with one of mental labor. How much one may drink is a matter of habit or idiosyncrasy, but any excess is injurious. The wine of different vintages varies considerably in composition. An old farmer was in the habit of drinking nearly four pints a day, in which there was five per cent. of alcohol, or more than three ounces. A new vintage yielded ten per cent. of alcohol. Bouchardat cautioned him, if he valued health or life, to reduce his potations to a single litre. The old man affected to acquiesce, but said to a friend, as the doctor went away, "Il ne me fera jamais croire qu'un litre de vin en vaut deux." He did not believe in analyses. He kept to his two litres, with six or seven ounces of alcohol, but he never saw another vintage ; within six months, "mon fermier était mort."

Madeira, sherry, and marsala wines, sold in France, contain about twenty-five per cent. of alcohol. It is not probable that they contain less in America.

Wines are very commonly adulterated in France; and of course our fellow-citizens rarely drink pure French wine. The *Journal de Médecine* is responsible for the following verses:

> "Au quartier des Lombards opérant sa mixture,
> Bacchus est devenu le dieu de la teinture;
> Son liquide a cessé d'être le jus divin,
> Et, s'il rougit encore, c'est d'être appelé vin."

Beer.—Beer acts upon the nervous system by the amount of alcohol which it contains, by the carbonic acid, and by the active principle of hops. It has its uses. Thus, it may promote digestion, and repair rapid loss of flesh. The moderate use of it is generally safe. Its excessive use causes a distention of the stomach, with attendant torpor of the viscera, and impairment of their functions. It may and does lead often to obesity, and sometimes to diabetes. It is of course capable of producing intoxication, with all attendant evils.

It is not necessary to repeat here the destructive influence of ardent spirits on every part of the living organism, but we may say, with Bouchardat, that by common consent physicians and philosophers consider the abuse of alcohol as the greatest source of misery in the civilized world, and thereby of decay and premature death.

By the diffusion of ease and comforts, hygiene makes its greatest advances; and it is certain that the abuse of alcoholic liquors, by degrading men when it does not directly kill them, diminishes address, skill, strength, capacity for work, intelligence, foresight, morality, sense of family obligations, and therefore and thereby detracts from that general ease and well-being which is the corner-stone upon which progressive hygiene reposes.

Adulterations.—The *adulteration* of liquors, wines, etc., is a matter worthy of great attention. Some extracts from a report of a committee of the Medico-Legal Society of New York, on "Intoxicating Liquors," will not be deemed now out of place.

Ardent spirits are adulterated in different ways: some with mere harmless flavoring-matters, and others with an excess of fusel-oil and other noxious materials, "which poison the body and destroy the mind."

"But in regard to wines, beers, etc., not made in this country, there seems to be no question that injurious adulterations exist to a large extent. Lager-beer, which has become almost a national drink, and whose consumption has happily beguiled many from indulging in stronger beverages, and has therefore worked in the direction of temperance, is now largely adulterated with mixtures that are entailing upon their victims Bright's disease of the kidneys, destruction to the linings of the stomach, etc. Surely, so long as persons will drink artificial beverages, be it tea, coffee, lager-beer, or what not, it is the duty of the State to recognize that fact, and institute safeguards to prevent the admixture therewith of poisons or noxious ingredients which form no part of the beverage in its purity."

The committee believe that "some modification should be made in that (excise) law in respect to light wines—wines containing but a small percentage of alcohol. As the law now stands, persons who are accustomed, say, to claret wine for dinner, if they should have occasion to dine at a restaurant, not an inn or hotel, would be denied their favorite beverage. The law, to be efficient, needs not to expel these wines from such places."

The committee recommend the Legislature to pass an act securing a standard of purity for all fermented and distilled liquors.

The report concludes in the following terms: "Wines containing not exceeding fifteen per cent. of their volume of

alcohol to be deemed light wines; and they should be classed with ales, beers, cider, etc.," to be sold at inns "under proper restrictions."—(*Sanitarian*, May, 1878.)

We will now introduce extracts or opinions from an admirable essay upon "The Use of Alcohol in Diet," by Prof. Robert T. Edes, of Boston.

Alcohol is food: this is asserted, and sufficient proof is adduced to sustain the assertion. But the "effect of alcohol in any dose other than a very small one may be stated as a gradually progressive blunting of the sensitiveness of the nervous system. Beginning with the higher intellectual manifestations, confusion of thought is among the earliest symptoms which betray its influence. As this increases we have a gradual removal of the restraints which reserve, timidity, habits, education, conscience, or a sense of decency, impose upon the lower nature, while the impulses and passions come to the surface. *In vino veritas.* Finally, even these disappear in a temporary imbecility and stupor."

Below this depth, paralysis, complete, or even death. This is narcotism.

But what is stimulation? "It may be doubted whether such a condition as true stimulation by alcohol exists, *for the perfectly healthy man in a normal condition.* The early phenomena, if carefully observed, are better explained as the beginning of intoxication. . . .

"Few men who might wish to have possession of the full vigor and acuteness of their intellect—as, for instance, a lawyer matched against a keen and watchful antagonist, an accountant disentangling a complicated page of figures, or a surgeon about to perform a critical operation—would attempt to increase their legal acumen, sharpen their perceptions, or give calmness to the judgment, with alcohol."

When a set of "good fellows" (bad fellows?) get together over their cups and grow witty, an abstainer, as Dr. Chambers says, finds their jokes dull and their anecdotes pointless, and his principal amusement consists in his ob-

servation of their curious bluntness to the absurdity of their merriment.

The goodness of the jest in such cases is surely rather "in the ear of him who hears it (muddled as his senses are) than in the mouth of him who utters it."

Stimulation aids failing powers. "The relief of syncope or fainting by a glass of wine is the most marked example of this action. A bringing up of the brain to its proper working level by alcohol implies that it must previously have fallen below it. It is restoration, rather than stimulation, in the etymological sense."

A man is sometimes braced up for a transient effort by alcohol, but "successive attempts to secure this result by successive doses, and to 'keep up the strength with liquor,' usually end in disastrous failure. . . .

"On the other hand, after the occasion for the exertion is over, and before the force expended has been made good by the digestion of food and by sufficient rest, the period of fatigue and depression may well be bridged over by a little alcohol.

"Under these circumstances, perhaps, as nearly as under any in the healthy man, the *true* stimulant action of alcohol is exerted, and it is remarkable that we do not then have the effects to which the word 'stimulant' is conventionally applied, that is, to the symptoms of approaching drunkenness."

Various military (medical) authorities, including Prof. Parkes, *facile princeps* in such matters, are brought forward to show that, while alcohol revives the *exhausted* man, it takes from the force of one who has work before him. Intelligent men asserted that taking grog while *on the march* caused a short sense of revival, which was soon followed by more than usual languor.

"Dr. Parkes also reports several experiments with careful and intelligent men performing measured amounts of work, as to the comparative value of beef-tea, coffee, and

rum, in sustaining power during a march, the result in all cases being against the rum."

Is alcohol to be relegated entirely to the laboratory of the chemist, and to the shelves of the pharmacist? Shall wine and beer be used no more except as medicines? "If the intending user," says Dr. Edes, "is conscious that a little wine means for him unlimited wine, there is no doubt that for him abstinence is the only safe condition. . . . But if its use does not mean excess, have we a right to relax a little on suitable occasions under the influence of wine? If it promote cheerfulness and good-fellowship, does it not indirectly tend rather to health than to disease? Dr. Chambers, after speaking of certain aromatic wines, says: 'All of these five classes of wines, prudence will reserve for festive purposes and occasions; the wise man who wishes to enjoy life will make them always exceptional; for, as idlers have no holidays, so perpetual feasters ruin all the pleasures of variety; but I am quite sure that the not unfrequent manufacture of occasions for domestic rejoicing—a birthday, a wedding anniversary, a harvest-home, a horse sold, the planting of a tree, the calving of a cow, a daughter presented at court or cutting her first tooth, or any good stroke of business—is a good promoter, not only of love and happiness, but of personal health. Let the beverages which celebrate these occasions be chosen for their peculiar and exceptional flavors. If they are good of their class, the moderate use will not shorten but both cheer and lengthen life.'"

Dr. Edes says, withal: "We can hardly help, as practical philanthropists, rejoicing in the change which is said to be taking place in the drinking-habits of our fellow-citizens; I mean the substitution of beer for stronger liquors, and a consequent partial abandonment of the pernicious American habit of 'perpendicular drinking.'"

Beer and light wine are certainly less prejudicial than such liquors as gin and whiskey. "The substitution is an

improvement, and should be favored by all those who recognize the repeated failures of coercive legislation to alter the habits of a community and make it virtuous against its will."—(*Penn Monthly*, August, 1877.)

It has been justly said that few men who wish to make vigorous intellectual efforts would attempt to fortify their powers by alcohol. The public sometimes draw wrong conclusions touching this matter. Very able men have been known to make powerful speeches, for example, when under the stimulus of alcohol. This is true. But the stimulus does nothing more than give animation to the voice or manner of the speaker ; the argument presented has generally been elaborated in a quiet study without aid or hinderance from so unreliable an ally. Hinderance would be the presumption, aid exceedingly improbable.

We have it upon classic authority that the ancient Goths of Germany had a wise custom of debating everything of importance to their state twice ; that is, once drunk, and once sober : drunk, that their counsels might not want vigor, and sober, that they might not want discretion.—(Tacitus, "De Germania.")

The public speaker who electrifies his audience under such Gothic inspiration may be assumed to have reversed the order ; that is, to have taken sober counsel with himself before a factitious and very uncertain vigor has succeeded to the tranquil hour of discretion.

With apparent discrepancies the most observant physicians preserve pretty nearly equal views about the use and abuse of alcohol. Some, indeed, as Dr. Richardson, admit no use for it, except for medical purposes, and many of our most intelligent men, practising medicine or not, as Dr. Holland, of *Scribner's Magazine*, who is a hygeist too, are of the same opinion. But it must be remembered that, though alcohol is, when improperly used, a *poison*, it is equally a *food* when properly used.

Its destructive powers are certainly fearful. It sends

not only drunkards to premature graves, but hecatombs of worthy men who are undermined by it, unconsciously to themselves, and without suspicion of its work on the part of their friends. The writer has seen this fact demonstrated plainly, to his mind at least, upon various mournful occasions. It is a cumulative poison. The perpetual use of it, in slight daily excess, does its work so insidiously that the evil is not appreciated until it is beyond repair. Every tissue becomes saturated in time, and blood, and nerves, and viscera, are hopelessly poisoned. Richardson says as much, but he may be *ultra*. Then Murchison tells us that, "of all ingesta, the various alcoholic drinks are most apt to derange the liver." And the importance of the liver to the whole organism is not overrated, even in the popular opinion, as to hepatic disorders or diseases.

That alcohol muddles the brain, the ingenuous reader may probably admit from his own experience; but he does not know what organic changes may be induced by it in that viscus. For the unlearned in organic chemistry we will cite a single passage from a late standard authority:

"All the principles of which brain-matter is composed are, *en masse* (with the exception of the albuminous framework), soluble in warm alcohol, although the individual principles are not all soluble under these conditions. The question occurs here, Can a man consume so much alcohol in the form of stimulants, and retain enough in his blood, in the unoxidized condition, to dissolve traces of matter from his brain? Actual experiments, made by Mr. Kingsett, appear to favor the hypothesis of a solvent action exerted by alcohol on the brain of the living individual."—("Annual Cyclopædia," 1876.)

We have said that alcohol is cumulative in its influence, that is to say, that continuous draughts, even though in very slight excess over the admissible, are ever growing in destructiveness.

The following passage, from Aitkin's "Practice," will

sustain this assertion: "The *cumulative* effects of long-continued intemperance have been clearly proved by Dr. Ogston's observations; and the results of his *post-mortem* inspections, on the whole, support the conclusions which have been arrived at on *theoretic grounds* as to the injurious effects of alcohol in excess. The following statements contain a summary of these results: 1. The *nervous centres* present the greatest amount of morbid change, the morbid appearances within the head extending over ninety-two per cent. of those examined; 2. The changes in *respiratory organs* succeed in frequency those of the nervous centres, yielding a percentage of 63.24 of those examined; 3. Morbid changes in the liver are next in order of frequency, and are due to enlargement, granular degeneration, the nutmeg-like congestion, and, lastly, the fatty state; 4. Next to changes in the liver come those in the heart and large arteries; 5. Next are those of the kidneys; 6. Least frequent of all are the morbid changes in the alimentary canal."

Any thoughtful man will find this category sufficiently suggestive without further comment.

The elder Disraeli, in an essay on the "Drinking Customs in England," says: "We shall probably outlive that custom of hard drinking which was so long one of our national vices." He instances the comparative temperance of the Frenchman, the Italian, and the Spaniard. He says the English acquired their habits of excess in the long wars in the Netherlands, where by imitation "they learned to drown themselves in immoderate drinking, and by drinking others' health to impair their own." This has been the bane of Americans too, especially in the convivial South. Severe laws were passed under Queen Elizabeth and James I., to suppress the newly-imported mania. "Tom Nash, a town-wit of the reign of Elizabeth, long before Camden wrote her history, in his 'Pierce Pennilesse,' had detected the same origin. 'Superfluity in drink,' he says, 'is a sin that ever since we have mixed ourselves with the Low

Countries is counted honorable ; but before we knew their lingering wars was held in the highest degree of hatred that might be. Then if we had seen a man wallowing in the streets, or lain sleeping under the board, we should have spet at him, and warned all our friends out of his company.' "

It would seem that the cockney Mrs. Ramsbotham *avait raison*, after all, when she refused to let Amelia extend her tour through the *Low Countries.*

Hard drinking cannot be considered a national vice in this country, but still there is a great deal too much of it. Ardent spirits should be used remedially, not as a pleasant beverage. We do not mean to assert that a glass of grog is in itself a fatal poison. We do say, however, that it is more apt to do *harm* than *good* to the consumer when taken, not for just cause, but merely for sensual gratification. We say also that, if a man takes it to strengthen him for work about to be undertaken, the result will be exactly the reverse. We say, furthermore, that if he takes it to protect himself against cold, to which he is about to be exposed, he will suffer not less but more from the cold, and with more risk to health and life. If he takes it upon a healthy stomach, to promote digestion, he will thereby impair digestion. Briefly, we know of no use for ardent spirits except remedial use, which ought to be resorted to with due circumspection. Some persons use it as a corrective against what Prof. Bartholow calls very properly *ice-water dyspepsia*, but there is a safer method of getting rid of that form of disease.

We have just said that alcohol does not aid digestion, that is, normal digestion, in a healthy stomach, with appropriate food.

The reader may be interested in learning what is said upon this matter by two eminent modern authorities who express the scientific views of the day upon the subject :

" In the stomach, alcohol causes a sense of warmth, which

diffuses over the abdomen, and is quickly followed by a general glow of the body. In moderate quantity, it induces a superficial congestion of the mucous membrane—a dilatation of the arterioles—and this increased blood-supply enables the mucous follicles and the gastric glands to produce a more abundant secretion. The increased formation of the stomach-juices is doubtless somewhat determined by the stimulation of the mouths of the glands, in accordance with a well-known physiological law. The excitation of the gastric mucous membrane, when habitual, results in important changes ; a gastric catarrh is established, for the mucous follicles, under the influence of repeated stimulation, pour forth a pathological secretion. The gastric glands at first simply produce an increased amount of gastric juice, but abnormal stimulation results in pathological changes in this secretion. The increased blood-supply to the mucous membrane sets up an irritation of the connective tissue, which undergoes hyperplasia ; the proper secreting structure is encroached upon, and the glands undergo atrophic changes which result in still more important modifications of the gastric juice. Alcohol also affects directly the constitution of the gastric juice by precipitating the pepsin from its solution, and by arresting the activity of this ferment.

"In small doses, not too frequently repeated, alcohol increases the digestive power, by stimulating the flow of blood, and soliciting a greater supply of the stomach-juices. Large doses impair digestion directly by precipitating the pepsin, an albuminoid ferment. That a small quantity does not produce the same results in a comparative degree, is simply due to the fact that it is too far diluted, by the quantity of fluid present in the stomach, to act on the pepsin.

"The structural alterations induced by the habitual use of alcohol, and the action of this agent on the pepsin, seriously impair the digestive power. Hence it is that those who are habitual consumers of alcoholic fluids suffer from

disorders of digestion—gastric catarrh. The abnormal mucus, which is elaborated in great quantity, acts the part of a ferment, and the starchy, fatty, and saccharine elements of the food undergo the acetic, lactic, and butyric fermentation. Acidity, heart-burn, pyrosis, regurgitation of food, and a peculiar retching in the morning, are produced."—("Materia Medica and Therapeutics," by Roberts Bartholow, M. D., etc.)

Such is the language of the therapeutist. And now let us cite the physiologist :

"Alcohol diminishes the activity of nutrition. If its use be long continued, the assimilative powers of the system become so weakened that the proper quantity of food cannot be appropriated, and alcohol is craved to supply a self-engendered want. The organism may, in many instances, be restored to its physiological condition by discontinuing the use of alcohol ; but it is generally some time before the nutritive powers become active, and alcohol, meanwhile, seems absolutely necessary to existence.

"Under ordinary circumstances, when the organism can be adequately supplied with food, alcohol is undoubtedly injurious. When the quantity of food is insufficient, alcohol may supply the want for a time, and temporarily restore the powers of the body ; but the effects of its continued use, conjoined with insufficient nourishment, show that it cannot take the place of assimilable matter." And yet . . . . "inasmuch as temporary insufficiency of food, great exhaustion of the nervous system, and various conditions in which alcohol seems to be useful, must of necessity often occur, it is hardly proper that this agent should be utterly condemned ; but it is the article, *par excellence*, which is liable to abuse, and the effects of which on the mind and body, when taken constantly in excess, are most serious."—("A Text-Book on Human Physiology," by Austin Flint, Jr., M. D., etc. ; D. Appleton & Co., 1877.)

Wines are less hurtful to health than the stronger al-

coholic potations, though they are not among the necessaries of life. Yet when one remembers the marriage-feast at Cana, he cannot well pass unconditional condemnation on the use of wine. Use and abuse unfortunately have traveled down the stream of time together through all ages, and probably will so travel to the end; but, nevertheless, *abusus non tollit usum.*

Judging from the general habits of wine-producing countries, and those which do not produce it, the argument favors the culture of the vine, and the use of its product. Men cannot be bound down to restrict themselves to things merely necessary for existence. There is no evidence against the daily consumption of wine as unfavorable to health or longevity. Cornaro never gave up the (measured) use of it. Epicurus, who was a total-abstinence man of the strictest order, died at the completion of his threescore and ten, with the infirmities of age, whereas Cornaro was free from them up to the time of his death, at fivescore. It is not asserted that wine gave longevity to the one, or that the want of it took longevity from the other; the simple assertion is made of the facts. The writer asserts nothing more than that there is use of wine, which is not abuse. He can readily believe that Circe's cup which transformed the Tuscan mariners into groveling swine was the same that has thus degraded the weak and unwary through all succeeding ages. It came from Bacchus—

> "Bacchus, that first from out the purple grape
> Crushed the sweet poison of *misused wine.*"

Milton expressed it properly—*misused wine.* When is wine misused? We should say, when taken between meals; when taken *before* mental or physical labor; when taken in such quantities as to disturb the intelligence. The quality should be good, and preferably of native production. The quantity must be so limited that the day's allowance shall not intrude over two ounces (four tablespoonfuls) of alcohol

into the living organism. We do not *commend* the use of so much wine to any healthy man. If he be sufficiently well fed he will not need it, but he may take so much without detriment. If he exceeds the limit, it is at his own peril—at the peril of sapping his own vital foundations; if he take less or none, he will never have occasion to regret his abstemiousness. Murchison says that malt-liquors and wines are more apt to disagree with the liver than the same amount of alcohol in gin or whiskey largely diluted—though these are injurious also—but that of wines, those least likely to derange the functions of the organs are claret, hock, Moselle, and dry sherry.

Vinum potens, vinum nocens, always. As men will drink something stronger or other than water, it will be well when our country shall supply mild native wines containing not more than ten per cent. of alcohol. The working-man could take as much of this as he usually does of tea and coffee; and, if only at meals, it would give them additional relish without any harm to his moral or physical condition. The history of civilization will, in the main, sustain this statement.

When Disraeli hoped that his generation would outlive the national vice of hard drinking in England, he surely expected that the favorable change would come through the use of milder potations; and he immediately adduced the habits of the people of the south of Europe, among whom hard drinking is never a national or common vice. A correspondent of the *Baltimore Sun*, now writing from London, says that in no part of the world, civilized or uncivilized, "will you see such systematic scenes of perverse adherence to beastly intoxication;" but that "the vagabond drunkard is looked at complacently in London. Why? Because the best revenue of the public treasury comes from besotted and brutal drunkenness. Why not stop it? Because the chief law-makers in the Parliament of this Christian land, because the wealthy influential voters in this

Parliament, directly and indirectly, are interested in the sale of intoxicating drinks, and vote in one solid body for every measure that promotes the sale of this popular poison called gin and beer, and vote in a solid body against every measure that impedes in the least its sale."

This being so, the reform desired and expected seems to have no probability of early realization. We cannot agree with the writer, however, in calling beer a poison, except where there is criminal adulteration, from which the Government should protect the people. Beer in itself is not a poison; and only excess in quantity or vitiation in quality renders it unsafe as a popular beverage. The Government should see to the *quality;* the rational man to the *quantity* that he may consume without detriment to his physical or moral well-being. He should not forget its capability of inducing, by excessive use, not only obesity, but liver-disease (*Murchison*), with impairment of the functions of all the viscera, and even the formidable and incurable disease known as *diabetes* (*Bouchardat*). It is the abuse, however, and not the temperate use, which is likely to produce these maladies.

CHAPTER VIII.

TOBACCO.—CHEWING AND SMOKING.—WITH REPORT OF NAVAL SURGEONS.

Extremists who treat of tobacco generally begin by telling us that it contains *nicotin*, and that nicotin is a deadly poison. They can prove this assertion from numerous scientific authorities. The inference proposed is that the use of tobacco ought to be entirely given up, at least by persons not inclined deliberately to poison themselves.

The effect upon the public would be better if such questions were more fairly treated. Prussic acid is a deadly poison. Wild-cherry bark contains this acid, and yet the ordinary cold infusion, unless strangely misused, is quite safe as well as advantageous in many instances for the consumer. As the prussic acid is not in sufficient quantity to prove deleterious, so nicotin in tobacco is in too limited quantity to prove directly dangerous. The true state of the case should be fairly presented.

Dr. Richardson gives a summary paragraph on the use of "the weed:"

"Smoking tobacco, and the use of tobacco in every form, is a habit better not acquired, and, when acquired, is better abandoned. The young should specially avoid the habit. It gives a doubtful pleasure for a certain penalty. Less destructive than alcohol, it induces various nervous changes, some of which pass into organic modifications of function. So long as the practice of smoking is continued, the smoker is temporarily out of health. When the odor of tobacco hangs long on the breath and other secretions of the smoker, that smoker is in danger. Excessive smoking has proved directly fatal."

We cannot agree with this able hygeist in saying that, so long as the practice of smoking is continued, the smoker is temporarily out of health. Otherwise we may frankly concede what he has to say upon this important subject. We believe that accumulated facts go to show that growing boys are the worse mentally and physically for the use of tobacco. It should be kept out of schools as far as possible. But the assertion that all men are temporarily out of health while smoking is certainly a mistake. For the word *all* let *some* be substituted, and there will be no room for argument. We see, every day of our lives, men smoking moderately after meals, who maintain as good a standard of health as other men who do not use tobacco in any of its forms.

That tobacco is injurious to growing boys, especially to schoolboys, is a subject not open to discussion. The medical officers of the Naval Academy at Annapolis, in the subjoined report, but express the general sentiment of the profession in regard to a matter of such great importance in school hygiene :

REPORT ON THE USE OF TOBACCO BY THE CADETS AT THE UNITED STATES NAVAL ACADEMY.

UNITED STATES NAVAL ACADEMY, ANNAPOLIS, MARYLAND, *December* 2, 1875.

GENTLEMEN : The regulations of the Naval Academy prohibit the use of tobacco by the cadets, as a sanitary precaution, and as calculated to lessen their capacity for study. I am having much difficulty in enforcing this regulation, and if it be unnecessary I shall be glad to know it.

You are, therefore, appointed a board to carefully consider this subject, and to give me your views thereon.

Very respectfully yours,

C. R. P. RODGERS,

Rear-Admiral, Superintendent.

Medical Inspector ALBERT L. GIHON, U. S. N.
Medical Inspector ALBERT C. GORGAS, U. S. N.
Surgeon GEORGE A. BRIGHT, U. S. N.

MEDICAL DEPARTMENT, UNITED STATES NAVAL ACADEMY,
ANNAPOLIS, MARYLAND, *December* 3, 1875.

SIR: The board, appointed by your order of the 2d instant, to consider the subject of the use of tobacco by the cadets at this Academy, beg to report as follows:

The impropriety of this practice has been represented by the various medical officers successively attached to this Academy. As early as March 22, 1861, Dr. Palmer wrote to the superintendent with respect to a case of "nausea and nervous derangement, rendering him (an acting midshipman) unfit for study or recreation," of which the cause was the confessed use of tobacco: "It is not my design, though it might be my duty, to make this a report of infraction of discipline, but only to offer an authentic example of a practice prevalent to an alarming extent in the Academy. If one of the most mature and robust of our young men is obliged to confess himself unable to pursue his studies in consequence of the use of tobacco, how much more actively must the same poison operate upon many who are mere boys, adopting this deleterious habit from the example of their seniors! There is good reason to believe that a large number of vague complaints for which midshipmen report to the surgeon must be attributed solely to the use of tobacco. I know of no other mode of accounting for the *malaise*, want of sleep, dizziness, headache, nausea, etc., of which I receive frequent representations; and, finally, it is my deliberate opinion that the unsatisfactory recitations and consequent failures at final examination, so injurious to the interests of this establishment, are to be attributed, in great measure, to nervous derangement caused by the common use of tobacco by the students. It becomes my duty to recommend some stringent measures to correct this practice."

Experience since that time has been confirmatory of the opinion here so ably set forth by Surgeon Palmer (since Surgeon-General of the Navy). Whatever arguments may be adduced in favor of the rational and temperate use of tobacco by adults, no doubt exists among medical men as to its injurious effects upon the growing organisms and mental powers of the young. Functional derangements of the digestive, circulatory, and nervous systems manifest themselves in the form of headache, confusion of intellect, loss of memory, impaired power of attention, lassitude, indisposition to muscular effort, nausea, want of appetite, dyspepsia, palpitation, tremulousness, disturbed sleep, impaired vision, etc., any one of which materially lessens the capacity for study and application and

most of which are daily subjects of complaint to the medical officers and form so large a proportion of the sick-lists, that the extent of surreptitious indulgence in smoking and chewing may be inferred.

The recent experiment of permitting smoking at the Academy has satisfactorily demonstrated the especial impropriety of the practice at an institution of this character. The further evil of moral contamination from the necessarily unrestrained intercourse and language of the smoking-room was superadded to physical and mental impairment. This apartment became the chosen resort of the leisure hour, its stifling atmosphere injuring health all the more seriously from the intensified form in which the tobacco-fumes were offered for absorption into the system, while out-door exercise and recreation were proportionably neglected.

The board have confined themselves in this report to the consideration of the effects of the use of tobacco upon the cadets at this Academy. For this reason no mention has been made of certain organic diseases attributed to the prolonged use of tobacco, or of the serious nervous disorders which sometimes follow its excessive use. In most cases the first and early attempts to smoke or chew produce nausea, vomiting, tremors, and prostration. These symptoms lessen in severity as the practice is continued, and usually it is only after protracted habit that perfect tolerance is secured. Should tobacco be allowed, a large number of beginners would be subjected to this experience, a condition of things which would militate against the good effects of the sanitary regulations of this school, which have, in all other respects, maintained so high a standard of health.

The board are of opinion, therefore, that the regulations against the use of tobacco in any form cannot be too stringent; and, further, that, while smoking should be wholly interdicted, especial care should be exercised to prevent the substitution of chewing, the more deleterious practice.

Very respectfully,

Your obedient servants,

ALBERT L. GIHON,
Medical Inspector, U. S. N.
ALBERT C. GORGAS,
Medical Inspector, U. S. N.
GEORGE A. BRIGHT,
Surgeon, U. S. N.

Rear-Admiral C. R. P. RODGERS, U. S. N.,
Superintendent United States Naval Academy.

The views as expressed in this report find but a partial application with adults. We see with the moderate use of tobacco as much of health and longevity and perhaps more of comfort than we see without its use.

Hufeland has something to say which finds application here. Agreeable stimulants to the senses, he says, "have a double effect in the prolongation of life. In the first place, by their immediate influence on the vital power, they enliven, strengthen, and exalt it; and, secondly, by increasing the activity of the whole machine, they put into much greater activity the organs of digestion, circulation, and secretion, which perform the most important functions of restoration. A certain cultivation and refinement of our sensibility is, therefore, healthful and necessary, because it renders us more susceptible of these enjoyments; only it must not be carried too far, else it may become a disease. In stimulating the senses, great care must be taken also not to exceed the proper measure; for the same enjoyment which, when used in a moderate degree, is capable of restoring, may, if used too much, consume and exhaust.

"All agreeable stimulants, which can affect us through the sight, hearing, smell, taste, and feeling, may be included under this head; and therefore the pleasures of music, painting, and the other imitative arts, poetry, etc., as they can exalt and renew these enjoyments."

This is good philosophy, as well as good hygiene. A man may derive more harm than good from smoking, and his wife may likewise derive more harm than good from the use of tea, but these luxuries, *as all others*, must be used with discretion. With untold multitudes of people, they increase comfort and contentment, and they are properly and rightfully used when such are the results. But when they appreciably disturb the health, the digestive organs or the nervous system, which they will do if misused or which they will do with some con-

stitutions if used at all, then the harm certainly exceeds the good.

The writer has seen men fearfully injured by excessive smoking; he has seen, he thinks, fatal results from it, indirectly produced; but, nevertheless, he would not say that such results demand the total disuse of tobacco. Such, indeed, are very exceptional. Some irritation about the fauces, inducing habitual cough, some indigestion, some nervous tremors, some headache, are common results of imprudent smoking. This habit is capable, in some instances, of affecting the eyesight very seriously, or even of destroying it. Prof. Chisolm recently made a report to the Baltimore Academy of Medicine, "On the Poisonous Effects of Tobacco on the Eyesight," in which he stated that in the past few years he had treated thirty-five cases of *amaurosis*, directly traceable to the use of tobacco, by smoking, in every case but one. When the sight fails with smokers, and no appreciable change of structure can be found in the eye, tobacco-poisoning may be assumed. If not cured, organic change will be found ultimately in atrophy of the optic nerve.

The assumption is converted into certainty by the fact that appropriate remedies fail entirely while the habit of smoking is continued; whereas, when it is abandoned, cures may usually be effected rapidly. The tobacco amaurosis mostly affects persons who smoke to excess; but, in rare instances, the susceptibility is so great that the smoking of a single cigar a day will produce it. And yet it is but the truth to say that many thousands of men smoke tobacco with much enjoyment, without any appreciable evil results, and even with that beneficial influence which so good an authority as Hufeland positively commends.

Dr. Hammond ("Treatise on Hygiene") says of tobacco: "As a soother to the mind and promoter of reflection, tobacco is entitled to great consideration; and I am decidedly of the opinion that it is beneficial to those who like soldiers,

have a great deal of mental and bodily fatigue to undergo. It quiets the troubled mind, and disposes it to look with calmness on the ills which may bear harshly upon it. But these remarks apply only to the moderate use. When employed to excess, there is no doubt that it predisposes to neuralgia, vertigo, indigestion, and other affections of the nervous, circulatory, and digestive organs. Chewing should be altogether discarded, on account of the great loss it causes in saliva, and also because it is a filthy practice. Smoking is the only way of using tobacco which should be practised, and cigars, on account of their greater mildness, are preferable to pipes.

"But one of the best effects of tobacco, when used as it ought to be only after meals, is that which it produces over the secretion of gastric juice. It is very certainly established that any stimulant substance which increases the amount of saliva increases likewise the quantity of gastric juice. To prove this it is only necessary to make a gastric fistula in a dog, and to place strongly sapid substances, such as vinegar, aloes, or tobacco, in the mouth. Although no gastric juice may be issuing from the fistula, no sooner is the substance placed in the mouth, and the effect produced on the saliva, than the gastric juice begins to flow until a very considerable quantity has escaped, or as long as the action in the mouth continues. The beneficial influence of an after-dinner cigar is therefore important as aiding materially in the digestion of the food."

As there is no proof whatever that moderate smoking injures those who indulge in it, and as it is certain that the custom, in due limits, tends greatly to promote comfort, and to give a sense of satisfaction and contentment, the hygeist can only rightfully argue against excess, as he must indeed in reference to all sensual indulgences.

The writer has this day under professional care a Cuban gentleman, a teacher of languages, who desired a remedy for a constant and long-continued bitter taste and morning

vomiting of bile. Upon the closest questioning, no cause could be found for this disorder but one, to wit, the continuous smoking of cigarettes all day and every day. The first injunction, as may be supposed, was restriction; the second, if no relief from restriction, a total abandonment of the custom.

From what has been said, the intelligent reader may gather what use may be made of tobacco without detriment to health, if not to its positive promotion. The moderate smoking of mild, well-cured tobacco, in the form of cigars, after meals, one cigar, it may be, after each meal, will do no harm to a healthy man unless from idiosyncrasy. Many men are debarred entirely from the use of tobacco; many are injured by its use; but still the rule holds that there is no appreciable injury to the multitudes of men who use it within the limits of discretion. When men abuse God's gifts, whatever they may be, they abuse them at their own peril.

L'Envoi.

The writer has a strong faith in the coincidence of good health and good morals. He has endeavored in the preceding pages to keep their relations in view; with how much success must be left to the judgment of the reader.

He has expressed his own views freely, supporting them more or less fully with high authorities; and he has himself an abiding confidence in all herein proposed for the advancement of the objects coming within the scope of this work.

With a single exception, there is nothing that is or ought to be of so much interest to humanity as the subject of human health. The writer desires to keep this interest alive, and to diffuse it. He wishes it to be understood generally that the great science of medicine is not limited to the administration of drugs, inasmuch as it embraces everything tending to the physical well-being of the race.

An ancient author has said, "Whoever understands medicine thoroughly is never sick" (Asclepiades). This is an extravagant statement; but the man who has an intelligent acquaintance with hygiene will have a degree of immunity from sickness, if he acts according to his knowledge, not granted to other men; he will have, probably, not only an increase of longevity, but blessings which make age not only tolerable but even agreeable to himself and to those around him. He will have during his whole career in life a degree of contentment which is almost incompatible with bad health. When any ailment comes upon him, it will be more remediable than with those who know not or heed not the conservative laws of hygiene.

These are generally not hard to be understood. When obscure in themselves or in their application, medical advice should be taken, the good physician being necessarily a good hygeist also.

With combined prudence and intelligence on both sides, on the part of patient and physician, the most favorable results may always be expected; for, as it is said—

"Nullum numen abest si sit
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THE END.

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